

# **R309-210. Monitoring and Water Quality: Distribution System Monitoring Requirements.**

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## **R309-210. Monitoring and Water Quality: Distribution System Monitoring Requirements.**

### ***R309-210-1. Purpose.***

The purpose of this rule is to outline the monitoring requirements for public water systems with regard to their distribution systems.

### ***R309-210-2. Authority.***

This rule is promulgated by the Drinking Water Board as authorized by Title 19, Environmental Quality Code, Chapter 4, Safe Drinking Water Act, Subsection 104 of the Utah Code and in accordance with 63-46a of the same, known as the Administrative Rulemaking Act.

### ***R309-210-3. Definitions.***

Definitions for certain terms used in this rule are given in R309-110 but may be further clarified herein.

### ***R309-210-4. General.***

- (1) All public water systems are required to monitor their water to determine if they comply with the requirements for water quality stated in R309-200. In exceptional circumstances the Executive Secretary may modify the monitoring requirements given herein as is deemed appropriate.
- (2) The Executive Secretary may determine compliance or initiate compliance actions based upon analytical results and other information compiled by authorized representatives.
- (3) If the water fails to meet minimum standards, then certain public notification procedures must be carried out, as outlined in R309-220. Water suppliers must also keep analytical records in their possession, for a required length of time, as outlined in R309-105-17.
- (4) All samples shall be taken at representative sites as specified herein for each contaminant or group of contaminants.
- (5) For the purpose of determining compliance, samples may only be considered if they have been analyzed by the State of Utah primacy laboratory or a laboratory certified by the Utah State Health Laboratory.

(6) Measurements for pH, temperature, turbidity and disinfectant residual may, under the direction of the direct responsible operator, be performed by any water supplier or their representative.

(7) All samples must be marked either: routine, repeat, check or investigative before submission of such samples to a certified laboratory. Routine, repeat, and check samples shall be considered compliance purpose samples.

(8) All sample results can be sent to the Division of Drinking Water either electronically or in hard copy form.

(9) Lead and Copper data must be submitted to the Division of Drinking Water using forms provided by the Division.

(10) Unless otherwise required by the Board, the effective dates on which required monitoring shall be initiated are identical to the dates published in 40 CFR 141 on July 1, 2001 by the Office of the Federal Register.

(11) Exemptions from monitoring requirements shall only be granted in accordance with R309-105-5.

## ***R309-210-5. Microbiological Monitoring.***

### **(1) Routine Microbiological Monitoring Requirements**

Applicable to all public water systems (community, non-transient non-community and transient non-community).

(a) Community water systems shall monitor for total coliforms at a frequency based on the population served, as follows:

TABLE 210-1 TOTAL COLIFORM MONITORING FREQUENCY FOR PUBLIC WATER SYSTEMS	
Population served	Minimum number of samples per month
25 to 1,000	1
1,001 to 2,500	2
2,501 to 3,300	3
3,301 to 4,100	4
4,101 to 4,900	5
4,901 to 5,800	6
5,801 to 6,700	7

6,701 to 7,600	8
7,601 to 8,500	9
8,501 to 12,900	10
12,901 to 17,200	15
17,201 to 21,500	20
21,501 to 25,000	25
25,001 to 33,000	30
33,001 to 41,000	40
41,001 to 50,000	50
50,001 to 59,000	60
59,001 to 70,000	70
70,001 to 83,000	80
83,001 to 96,000	90
96,001 to 130,000	100
130,001 to 220,000	120
220,001 to 320,000	150
320,001 to 450,000	180
450,001 to 600,000	210
600,001 to 780,000	240
780,001 to 970,000	270
970,001 to 1,230,000	300
1,230,001 to 1,520,000	330
1,520,001 to 1,850,000	360
1,850,001 to 2,270,000	390
2,270,001 to 3,020,000	420
3,020,001 to 3,960,000	450
3,960,001 or more	480
Note: The 25 - 1,000 population figure includes public water systems which have at least 15 service connections, but serve fewer than 25 persons.	

(b) Non-transient non-community water systems shall monitor for total coliforms as follows:

- (i) A system using only ground water (except ground water under the direct influence of surface water) and serving 1,000 or fewer shall monitor each calendar quarter that the system provides water to the public.
- (ii) A system using only ground water (except ground water under the direct influence of surface water) and serving more than 1,000 persons during any month shall monitor at the same frequency as a like-sized community water system, as specified in Table 210-1. The Executive Secretary may reduce the monitoring frequency for any month the system

serves 1,000 persons or fewer. In no case may the required monitoring be reduced to less than once per calendar quarter.

(iii) A system using surface water, in total or in part, shall monitor at the same frequency as a like-sized community water system, as specified in Table 210-1.

(iv) A system using ground water under the direct influence of surface water shall monitor at the same frequency as a like-sized community water system, as specified in Table 210-1. The system shall begin monitoring at this frequency beginning six months after the Executive Secretary determines that the ground water is under the direct influence of surface water.

(c) Non-community water systems shall monitor for total coliforms as specified in R309-210-5(1)(b).

(d) The samples shall be collected at points which are representative of water throughout the distribution system according to a written sampling plan. This plan is subject to the approval of the Executive Secretary.

(e) A public water system shall collect samples at regular time intervals throughout the month, except that a system which uses only ground water (except ground water under the direct influence of surface water) and serves 4,900 persons or fewer, may collect all required samples on a single day if they are taken from different sites.

(f) A public water system that uses inadequately treated surface water or inadequately treated ground water under the direct influence of surface water shall collect and analyze for total coliforms at least one sample each day the turbidity level of the source water exceeds 1 NTU. This sample shall be collected near the first service connection from the source. The system shall collect the sample within 24 hours of the time when the turbidity level was first exceeded. The sample shall be analyzed within 30 hours of collection. Sample results from this coliform monitoring shall be included in determining total coliform compliance for that month. The Executive Secretary may extend the 24 hour limitation if the system has a logistical problem that is beyond the system's control. In the case of an extension the Executive Secretary shall specify how much time the system has to collect the sample.

## **(2) Procedures if a Routine Sample is Total Coliform-Positive**

(a) Repeat sampling -

The water system shall collect a set of repeat samples within 24 hours of being notified of the total coliform-positive sample result. The number of repeat samples required to be taken is specified in Table 210-2. The Executive Secretary may extend the 24 hour limitation if the system has a logistical problem that is beyond its control. In the case of an extension the Executive Secretary shall specify how much time the system has to collect the repeat samples.

TABLE 210-2 REPEAT AND ADDITIONAL SAMPLE MONITORING FREQUENCY			
Population Served by the System	# Routine Samples per Month	# Repeats for Each Total Coliform Sample Within 24 Hours	Number of Samples in ADDITION to the Routine Samples the Following Month
25-1000 (See Note 1 below)	1	4	4
100-2500	2	3	3
2501-3300	3	3	2
3301-4100	4	3	1
Greater Than 4100	5 or more	3	No Additional Samples Required. Refer to Table 210-1 for # of Routine Samples
<p>NOTE 1: The population category 25 - 1000 includes all non-transient non-community and non-community water systems. Non-transient non-community and non-community systems are only are required to sample once per calendar quarter on a routine basis for those quarters the system is in operation.</p> <p>Repeat and Additional Routine samples are only required if a Routine Sample is Total Coliform-Positive.</p>			

(b) Repeat sampling locations -

The system shall collect the repeat samples from the following locations:

- (i) One from the original sample site;
- (ii) One within 5 service connections upstream;
- (iii) One within 5 service connections downstream;
- (iv) If required, one from any site mentioned above.

If a total coliform-positive sample is at the end of the distribution system, or next to the end of the distribution system, the Executive Secretary may

waive the requirement to collect at least one repeat sample upstream or downstream of the original sampling site.

(c) The system shall collect all repeat samples on the same day, except that the Executive Secretary may allow a system with a single service connection to collect the required set of repeat samples on consecutive days.

(d) Additional repeat samples - If one or more repeat samples in a set is total coliform-positive, the system shall collect an additional set of repeat samples as specified in (a), (b) and (c) of this subsection. The additional repeat samples shall be collected within 24 hours of being notified of the positive result, unless the Executive Secretary extends the time limit because of a logistical problem. The system shall repeat this process until either total coliforms are not detected in one complete set of repeat samples or the system determines that the total coliform MCL has been exceeded and notifies the Executive Secretary and begins the required public notification.

(e) If a system collecting fewer than five routine samples per month has one or more total coliform-positive samples and the Executive Secretary does not invalidate the sample under R309-210-5(4), it shall collect at least five routine samples during the next month the system provides water to the public. Refer to Table 210-2 for the number of additional samples required.

(i) The Executive Secretary may waive the requirement to collect five routine samples the next month the system provides water to the public if the Executive Secretary has determined why the sample was total coliform-positive and establishes that the system has corrected the problem or will correct the problem before the end of the next month the system serves water to the public. In this case:

(A) The Executive Secretary shall document this decision in writing; and

(B) The Executive Secretary or his representative shall sign the document; and

(C) The Executive Secretary will make the document available to the EPA and the public.

(ii) The Executive Secretary cannot waive the additional samples in the following month solely because all repeat samples are total coliform-negative.

(iii) If the additional samples in the following month are waived, a system shall still take the minimum number of routine samples required in Table



210-1 of R309-210-5(1) before the end of the next month and use it to determine compliance with the total coliform MCL.

(f) Samples to be included in calculations - Results of all routine and repeat samples not invalidated in writing by the Executive Secretary shall be included in determining compliance with the total coliform MCL.

(g) Samples not to be included in calculations - Special purpose and investigative samples, such as those taken to determine the efficiency of disinfection practices following such operations as pipe replacement or repair, may not be used to determine compliance with the MCL for total coliforms. These samples shall be identified as special purpose or investigative at the time of collection.

### **(3) Response to violation**

(a) A public water system which has exceeded the MCL for total coliforms as specified in R309-200-5(6) shall report the violation to the Executive Secretary no later than the end of the next business day after it learns of the violation, and notify the public in accordance with R309-220.

(b) A public water system which has failed to comply with a coliform monitoring requirement shall report the monitoring violation to the Executive Secretary within ten days after the system discovers the violation and notify the public in accordance with R309-220.

### **(4) Invalidation of Total Coliform-Positive Samples**

An invalidated total coliform-positive sample does not count towards meeting the minimum monitoring requirements of R309-210-5(1) and R309-210-5(2). A total coliform-positive sample may not be invalidated solely on the basis of all repeat samples being total coliform-negative.

(a) The Executive Secretary may invalidate a total coliform-positive sample only if one of the following conditions are met:

(i) The laboratory establishes that improper sample analysis caused the total coliform-positive result; or

(ii) On the basis of the results of repeat samples collected as required in R309-210-5(2), the total coliform-positive sample resulted from a non-distribution system plumbing problem on the basis that all repeat samples taken at the same tap as the original total coliform-positive are total coliform-positive, but all repeat samples within five service connections are total coliform-negative; or

(iii) Substantial grounds exist to establish that the total coliform-positive result is due to a circumstance or condition which does not reflect water quality in the distribution system. In this case:

(A) The Executive Secretary shall document this decision in writing; and

(B) The Executive Secretary or his representative shall sign the document; and

(C) The Executive Secretary will make the document available to the EPA and the public. The system shall still collect the required repeat samples as outlined in R309-210-5(2) in order to determine compliance with the MCL.

(b) A laboratory shall invalidate a total coliform sample (unless total coliforms are detected) if the results are indeterminate because of possible interference. A system shall collect and have analyzed, another total coliform sample from the same location as the original sample within 24 hours of being notified of the indeterminate result. The system shall continue to resample within 24 hours of notification of indeterminate results and have the samples analyzed until a valid sample result is obtained. The 24-hour time limit may be waived by the Executive Secretary on a case-by-case basis if the system has logistical problems beyond its control. Interference for each type of analysis is listed below.

(i) The sample produces a turbid culture in the absence of gas production when using an analytical method where gas formation is examined.

(ii) The sample produces a turbid culture in the absence of an acid reaction when using the Presence-Absence Coliform Test.

(iii) The sample exhibits confluent growth or produces colonies too numerous to count when using an analytical method using a membrane filter.

## **(5) Fecal coliforms/*Escherichia coli* (E. coli) testing**

(a) If any routine sample, repeat sample or additional sample is total coliform-positive, the system shall have the total coliform-positive culture medium analyzed to determine if fecal coliforms are present. The system may test for *E. coli* in lieu of fecal coliforms.

(b) Notification of Executive Secretary and public - If fecal coliforms or *E. coli* are confirmed present (as per R309-200-5(6)(b)), the system shall notify the

Executive Secretary by the end of the day when the system is notified of the test results. If the system is notified after the Division of Drinking Water has closed, the system shall notify the Executive Secretary before the close of the next business day and begin public notification using the mandatory health effects language R309-220) within 72 hours.

(c) The Executive Secretary may allow a system to forego the analysis for fecal coliforms or E. coli, if the system assumes that the total coliform positive sample is fecal coliform-positive or E. coli-positive. The system must notify the Executive Secretary of this decision and begin the required public notification.

## **(6) Best Available Technology**

The Executive Secretary may require an appropriate treatment process using the best available technology (BAT) in order to bring the water into compliance with the maximum contaminant level for microbiological quality. The BAT will be determined by the Executive Secretary.

### ***R309-210-6. Lead and Copper Monitoring.***

#### **(1) General requirements.**

(a) Applicability and effective dates

(i) The requirements of R309-210-6, unless otherwise indicated, apply to community water systems and non-transient non-community water systems (hereinafter referred to as water systems or systems).

(ii) The requirements in R309-210-6(2), R309-210-6(4), and R309-210-6(7) shall take effect December 7, 1992.

(b) R309-210-6 establishes a treatment technique that includes requirements for corrosion control treatment, source water treatment, lead service line replacement, and public education. These requirements are triggered, in some cases, by lead and copper action levels measured in samples collected at consumers' taps.

(c) Corrosion control treatment requirements

(i) All water systems shall install and operate optimal corrosion control treatment. However, any water system that complies with the applicable corrosion control treatment requirements specified by the Executive Secretary under R309-210-6(2) and R309-210-6(4)(a) shall be deemed in compliance with this treatment requirement.

(d) Source water treatment requirements

Any system exceeding the lead or copper action level shall implement all applicable source water treatment requirements specified by the Executive Secretary under R309-210-6(4)(b).

(e) Lead service line replacement requirements

Any system exceeding the lead action level after implementation of applicable corrosion control and source water treatment requirements shall complete the lead service line replacement requirements contained in R309-210-6(4)(c).

(f) Public education requirements

Any system exceeding the lead action level shall implement the public education requirements contained in R309-210-6(7).

(g) Monitoring and analytical requirements

Tap water monitoring for lead and copper, monitoring for water quality parameters, source water monitoring for lead and copper, and analyses of the monitoring results shall be completed in compliance with R309-210-6(3), R309-210-6(5), R309-210-6(6) and R309-200-8.

(h) Reporting requirements

Systems shall report to the Executive Secretary any information required by the treatment provisions of this subpart and R309-210-6(8).

(i) Recordkeeping requirements

Systems shall maintain records in accordance with R309-105-17(2).

(j) Violation of primary drinking water rules

Failure to comply with the applicable requirements of R309-210-6., including requirements established by the Executive Secretary pursuant to these provisions, shall constitute a violation of the primary drinking water regulations for lead and/or copper.

**(2) Applicability of corrosion control treatment steps to small, medium-size and large water systems.**

(a) Systems shall complete the applicable corrosion control treatment requirements described in R309-210-6(4)(a) by the deadlines established in this section.

(i) A large system (serving greater than 50,000 persons) shall complete the corrosion control treatment steps specified in R309-210-6(2)(d), unless it is deemed to have optimized corrosion control under R309-210-6(2)(b)(ii) or (b)(iii).

(ii) A small system (serving less than 3300 persons) and a medium-size system (serving greater than 3,300 and less than 50,000 persons) shall complete the corrosion control treatment steps specified in R309-210-6(2)(e), unless it is deemed to have optimized corrosion control under R309-210-6(2)(b)(i), (b)(ii), or (b)(iii).

(b) A system is deemed to have optimized corrosion control and is not required to complete the applicable corrosion control treatment steps identified in this section if the system satisfies one of the criteria in paragraphs (b)(i) through (b)(iii) of this section. Any such system deemed to have optimized corrosion control under this paragraph, and which has treatment in place, shall continue to operate and maintain optimal corrosion control treatment and meet any requirements that the Executive Secretary determines appropriate to ensure optimal corrosion control treatment is maintained.

(i) A small or medium-size water system is deemed to have optimized corrosion control if the system meets the lead and copper action levels during each of two consecutive six-month monitoring periods conducted in accordance with R309-210-6(3).

(ii) Any water system may be deemed by the Executive Secretary to have optimized corrosion control treatment if the system demonstrates to the satisfaction of the Executive Secretary that it has conducted activities equivalent to the corrosion control steps applicable to such system under this section. If the Executive Secretary makes this determination, it shall provide the system with written notice explaining the basis for its decision and shall specify the water quality control parameters representing optimal corrosion control in accordance with R309-210-6(4)(a)(vi). Water systems deemed to have optimized corrosion control under this paragraph shall operate in compliance with the Executive Secretary designated optimal water quality control parameters in accordance with R309-210-6(4)(a)(vii) and continue to conduct lead and copper tap and water quality parameter sampling in accordance with R309-210-6(3)(d)(iii) and R309-210-6(5)(d), respectively. A system shall provide the Executive Secretary with the following information in order to support a determination under this paragraph:

(A) the results of all test samples collected for each of the water quality parameters in R309-210-6(4)(a)(iii)(C).

(B) a report explaining the test methods used by the water system to evaluate the corrosion control treatments listed in R309-210-6(4)(a)(iii)(A), the results of all tests conducted, and the basis for the system's selection of optimal corrosion control treatment;

(C) a report explaining how corrosion control has been installed and how it is being maintained to insure minimal lead and copper concentrations at consumers' taps; and

(D) the results of tap water samples collected in accordance with R309-210-6(3) at least once every six months for one year after corrosion control has been installed.

(iii) Any water system is deemed to have optimized corrosion control if it submits results of tap water monitoring conducted in accordance with R309-210-6(3) and source water monitoring conducted in accordance with R309-210-6(6) that demonstrates for two consecutive six-month monitoring periods that the difference between the 90th percentile tap water lead level computed under R309-200-5(2)(c), and the highest source water lead concentration, is less than the Practical Quantitation Level (PQL) for lead as specified in R309-104-8.

(A) Those systems whose highest source water lead level is below the Method Detection Limit may also be deemed to have optimized corrosion control under this paragraph if the 90th percentile tap water lead level is less than or equal to the Practical Quantitation Level for lead for two consecutive 6-month monitoring periods.

(B) Any water system deemed to have optimized corrosion control in accordance with this paragraph shall continue monitoring for lead and copper at the tap no less frequently than once every three calendar years using the reduced number of sites specified in R309-210-6(3)(c) and collecting the samples at times and locations specified in R309-210-6(3)(d)(iv)(D). Any such system that has not conducted a round of monitoring pursuant to R309-210-6(3)(d) since September 30, 1997, shall complete a round of monitoring pursuant to this paragraph no later than September 30, 2000.

(C) Any water system deemed to have optimized corrosion control pursuant to this paragraph shall notify the Executive Secretary in writing pursuant to R309-210-6(8)(a)(iii) of any change in treatment or the addition of a new source. The Executive Secretary may require any such system to conduct additional monitoring or

to take other action the Executive Secretary deems appropriate to ensure that such systems maintain minimal levels of corrosion in the distribution system.

(D) As of July 12, 2001, a system is not deemed to have optimized corrosion control under this paragraph, and shall implement corrosion control treatment pursuant to paragraph (b)(iii)(E) of this section unless it meets the copper action level.

(E) Any system triggered into corrosion control because it is no longer deemed to have optimized corrosion control under this paragraph shall implement corrosion control treatment in accordance with the deadlines in paragraph (e) of this section. Any such large system shall adhere to the schedule specified in that paragraph for medium-size systems, with the time periods for completing each step being triggered by the date the system is no longer deemed to have optimized corrosion control under this paragraph.

(c) Any small or medium-size water system that is required to complete the corrosion control steps due to its exceedance of the lead or copper action level may cease completing the treatment steps whenever the system meets both action levels during each of two consecutive monitoring periods conducted pursuant to R309-210-6(3) and submits the results to the Executive Secretary. If any such water system thereafter exceeds the lead or copper action level during any monitoring period, the system (or the Executive Secretary, as the case may be) shall recommence completion of the applicable treatment steps, beginning with the first treatment step which was not previously completed in its entirety. The Executive Secretary may require a system to repeat treatment steps previously completed by the system where the Executive Secretary determines that this is necessary to implement properly the treatment requirements of this section. The Executive Secretary shall notify the system in writing of such a determination and explain the basis for its decision. The requirement for any small or medium size system to implement corrosion control treatment steps in accordance with paragraph (e) of this section (including systems deemed to have optimized corrosion control under paragraph (b)(i) of this section) is triggered whenever any small or medium size system exceeds the lead or copper action level.

(d) Treatment steps and deadlines for large systems

Except as provided in R309-210-6(2)(b)(ii) and (b)(iii), large systems shall complete the following corrosion control treatment steps by the indicated dates.

(i) Step 1: The system shall conduct initial monitoring (R309-210-6(3)(d)(i) and R309-210-6(5)(b)) during two consecutive six-month monitoring periods by January 1, 1993.

(ii) Step 2: The system shall complete corrosion control studies (R309-210-6(4)(a)(iii)) by July 1, 1994.

(iii) Step 3: The Executive Secretary shall designate optimal corrosion control treatment (R309-210-6(4)(a)(iv)) by January 1, 1995.

(iv) Step 4: The system shall install optimal corrosion control treatment (R309-210-6(4)(a)(v)) by January 1, 1997.

(v) Step 5: The system shall complete follow-up sampling (R309-210-6(3)(d)(ii) and R309-210-6(5)(c)) by January 1, 1998.

(vi) Step 6: The Executive Secretary shall review installation of treatment and designate optimal water quality control parameters (R309-210-6(4)(a)(vi)) by July 1, 1998.

(vii) Step 7: The system shall operate in compliance with the Executive Secretary specified optimal water quality control parameters (R309-210-6(4)(a)(vii)) and continue to conduct tap sampling (R309-210-6(3)(d)(iii) and R309-210-6(5)(d)).

(e) Treatment steps and deadlines for small and medium-size systems

Except as provided in R309-210-6(2)(b), small and medium-size systems shall complete the following corrosion control treatment steps by the indicated time periods.

(i) Step 1: The system shall conduct initial tap sampling (R309-210-6(3)(d)(i) and R309-210-6(5)(b) until the system either exceeds the lead or copper action level or becomes eligible for reduced monitoring under R309-210-6(3)(d)(iv). A system exceeding the lead or copper action level shall recommend optimal corrosion control treatment (R309-210-6(4)(a)(i)) within six months after it exceeds one of the action levels.

(ii) Step 2: Within 12 months after a system exceeds the lead or copper action level, the Executive Secretary may require the system to perform corrosion control studies (R309-210-6(4)(a)(ii)). If the Executive Secretary does not require the system to perform such studies, the Executive Secretary shall specify optimal corrosion control treatment (R309-210-6(4)(a)(iv)) within the following time-frames:

(A) for medium-size systems, within 18 months after such system exceeds the lead or copper action level,



(B) for small systems, within 24 months after such system exceeds the lead or copper action level.

(iii) Step 3: If the Executive Secretary requires a system to perform corrosion control studies under step 2, the system shall complete the studies (R309-210-6(4)(a)(iii)) within 18 months after the Executive Secretary requires that such studies be conducted.

(iv) Step 4: If the system has performed corrosion control studies under step 2, the Executive Secretary shall designate optimal corrosion control treatment (R309-210-6(4)(a)(iv)) within 6 months after completion of step 3.

(v) Step 5: The system shall install optimal corrosion control treatment (R309-210-6(4)(a)(v)) within 24 months after the Executive Secretary designates such treatment.

(vi) Step 6: The system shall complete follow-up sampling (R309-210-6(3)(d)(ii) and R309-210-6(5)(c)) within 36 months after the Executive Secretary designates optimal corrosion control treatment.

(vii) Step 7: The Executive Secretary shall review the system's installation of treatment and designate optimal water quality control parameters (R309-210-6(4)(a)(vi)) within 6 months after completion of step 6.

(viii) Step 8: The system shall operate in compliance with the Executive Secretary-designated optimal water quality control parameters (R309-210-6(4)(a)(vii)) and continue to conduct tap sampling (R309-210-6(3)(d)(iii) and R309-210-6(5)(d)).

### **(3) Monitoring requirements for lead and copper in tap water.**

#### **(a) Sample site location**

(i) By the applicable date for commencement of monitoring under R309-210-6(3)(d)(i), each water system shall complete a materials evaluation of its distribution system in order to identify a pool of targeted sampling sites that meets the requirements of this section, and which is sufficiently large to ensure that the water system can collect the number of lead and copper tap samples required in R309-210-6(3)(c). All sites from which first draw samples are collected shall be selected from this pool of targeted sampling sites. Sampling sites may not include faucets that have point-of-use or point-of-entry treatment devices designed to remove inorganic contaminants.

(ii) A water system shall use the information on lead, copper, and galvanized steel when conducting a materials evaluation. When an evaluation of this information is insufficient to locate the requisite number of lead and copper sampling sites that meet the targeting criteria in R309-210-6(3)(a), the water system shall review the sources of information listed below in order to identify a sufficient number of sampling sites. In addition, the system shall seek to collect such information where possible in the course of its normal operations (e.g., checking service line materials when reading water meters or performing maintenance activities):

(A) all plumbing codes, permits, and records in the files of the building department(s) which indicate the plumbing materials that are installed within publicly and privately owned structures connected to the distribution system;

(B) all inspections and records of the distribution system that indicate the material composition of the service connections that connect a structure to the distribution system; and

(C) all existing water quality information, which includes the results of all prior analyses of the system or individual structures connected to the system, indicating locations that may be particularly susceptible to high lead or copper concentrations.

(iii) The sampling sites selected for a community water system's sampling pool ("tier 1 sampling sites") shall consist of single family structures that:

(A) contain copper pipes with lead solder installed after 1982 or contain lead pipes; and/or

(B) are served by a lead service line.

When multiple-family residences comprise at least 20 percent of the structures served by a water system, the system may include these types of structures in its sampling pool.

(iv) Any community water system with insufficient tier 1 sampling sites shall complete its sampling pool with "tier 2 sampling sites", consisting of buildings, including multiple-family residences that:

(A) contain copper pipes with lead solder installed after 1982 or contain lead pipes; and/or

(B) are served by a lead service line.

(v) Any community water system with insufficient tier 1 and tier 2 sampling sites shall complete its sampling pool with "tier 3 sampling sites", consisting of single family structures that contain copper pipes with lead solder installed before 1983. A community water system with insufficient tier 1, tier 2 and tier 3 sampling sites shall complete its sampling pool with representative sites throughout the distribution system. For the purpose of this paragraph, a representative site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the water system.

(vi) The sampling sites selected for a non-transient non-community water system ("tier 1 sampling sites") shall consist of buildings that:

(A) contain copper pipes with lead solder installed after 1982 or contain lead pipes; and/or

(B) are served by a lead service line.

(vii) A non-transient non-community water system with insufficient tier 1 sites that meet the targeting criteria in R309-210-6(3)(a)(vi) shall complete its sampling pool with sampling sites that contain copper pipes with lead solder installed before 1983. If additional sites are needed to complete its sampling pool, the non-transient non-community water system shall use representative sites throughout the distribution system. For the purpose of this paragraph, a representative site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the water system.

(viii) Any water system whose distribution system contains lead service lines shall draw 50 percent of the samples it collects during each monitoring period from sites that contain lead pipes, or copper pipes with lead solder, and 50 percent of the samples from sites served by a lead service line. A water system that cannot identify a sufficient number of sampling sites served by a lead service line shall collect first draw samples from all of the sites identified as being served by such lines.

(b) Sample collection methods

(i) All tap samples for lead and copper collected in accordance with this section, with the exception of lead service line samples collected under R309-210-6(4)(c)(iii) and samples collected under (b)(v) of this section, shall be first draw samples.

(ii) Each first-draw tap sample for lead and copper shall be one liter in volume and have stood motionless in the plumbing system of each sampling site for at least six hours. First draw samples from residential

housing shall be collected from the cold water kitchen tap or bathroom sink tap. First-draw samples from a nonresidential building shall be one liter in volume and shall be collected at an interior tap from which water is typically drawn for consumption. Non-first-draw samples collected in lieu of first-draw samples pursuant to paragraph (b)(v) of this section shall be one liter in volume and shall be collected at an interior tap from which water is typically drawn for consumption. First draw samples may be collected by the system or the system may allow residents to collect first draw samples after instructing the residents of the sampling procedures specified in this paragraph. To avoid problems with residents handling nitric acid, acidification of first draw samples may be done up to fourteen days after the sample is collected. After acidification to resolubilize the metals, the sample must stand in the original container for the time specified in R309-200-4(3). If a system allows residents to perform sampling, the system may not challenge, based on alleged errors in sample collection, the accuracy of sampling results.

(iii) Each service line sample shall be one liter in volume and have stood motionless in the lead service line for at least six hours. Lead service line samples shall be collected in one of the following three ways:

(A) at the tap after flushing the volume of water between the tap and the lead service line. The volume of water shall be calculated based on the interior diameter and length of the pipe between the tap and the lead service line;

(B) tapping directly into the lead service line; or

(C) if the sampling site is a building constructed as a single-family residence, allowing the water to run until there is a significant change in temperature which would be indicative of water that has been standing in the lead service line.

(iv) A water system shall collect each first draw tap sample from the same sampling site from which it collected a previous sample. If, for any reason, the water system cannot gain entry to a sampling site in order to collect a follow-up tap sample, the system may collect the follow-up tap sample from another sampling site in its sampling pool as long as the new site meets the same targeting criteria, and is within reasonable proximity of the original site.

(v) A non-transient non-community water system, or a community water system that meets the criteria for R309-210-6(7)(c)(vii)(A) and (B), that does not have enough taps that can supply first draw samples, as defined in R309-110, may apply to the Executive Secretary in writing to substitute non-first-draw samples. Such systems must collect as many first draw

samples from appropriate taps as possible and identify sampling times and locations that would likely result in the longest standing time for the remaining sites. The Executive Secretary herein waives the requirement for prior Executive Secretary approval of non-first draw samples sites selected by the system.

(c) Number of samples

Water systems shall collect at least one sample during each monitoring period specified in R309-210-6(3)(d) from the number of sites listed in the first column (standard monitoring) in Table 210-3. A system conducting reduced monitoring under R309-210-6(3)(d)(iv) may collect one sample from the number of sites specified in the second column (reduced monitoring) in Table 210-3 during each monitoring period specified in R309-210-6(3)(d)(iv). Such reduced monitoring sites shall be representative of the sites required for standard monitoring. The Executive Secretary may specify sampling locations when a system is conducting reduced monitoring to ensure that fewer number of sampling sites are representative of the risk to public health as outlined in R309-210-6(3)(a).

TABLE 210-3 NUMBER OF LEAD AND COPPER SAMPLING SITES		
System Size (# People Served)	# of sites (Standard Monitoring)	# of sites (Reduced Monitoring)
Greater than 100,000	100	50
10,001-100,000	60	30
3,301 to 10,000	40	20
501 to 3,300	20	10
101 to 500	10	5
100 or less	5	5

(d) Timing of monitoring

(i) Initial tap sampling

The first six-month monitoring period for small, medium-size and large systems shall begin on the following dates in Table 210-4:

TABLE 210-4 INITIAL LEAD AND COPPER MONITORING PERIODS	
System Size (# People Served)	First six month Monitoring Period Begins On
Greater than 50,000	January 1, 1992
3,301 to 50,000	July 1, 1992
3,300 or less	July 1, 1993

(A) All large systems shall monitor during two consecutive six-month periods.

(B) All small and medium-size systems shall monitor during each six-month monitoring period until:

(I) the system exceeds the lead or copper action level and is therefore required to implement the corrosion control treatment requirements under R309-210-6(2), in which case the system shall continue monitoring in accordance with R309-210-6(3)(d)(ii), or

(II) the system meets the lead and copper action levels during two consecutive six-month monitoring periods, in which case the system may reduce monitoring in accordance with R309-210-6(3)(d)(iv).

(ii) Monitoring after installation of corrosion control and source water treatment

(A) Any large system which installs optimal corrosion control treatment pursuant to R309-210-6(2)(d)(iv) shall monitor during two consecutive six-month monitoring periods by the date specified in R309-210-6(2)(d)(v).

(B) Any small or medium-size system which installs optimal corrosion control treatment pursuant to R309-210-6(2)(e)(v) shall monitor during two consecutive six-month monitoring periods by the date specified in R309-210-6(2)(e)(vi).

(C) Any system which installs source water treatment pursuant to R309-210-6(4)(b)(i)(C) shall monitor during two consecutive six-month monitoring periods by the date specified in R309-210-6(4)(b)(i)(D).

(iii) Monitoring after Executive Secretary specifies water quality parameter values for optimal corrosion control

After the Executive Secretary specifies the values for water quality control parameters under R309-210-6(4)(a)(vi), the system shall monitor during each subsequent six-month monitoring period, with the first monitoring period to begin on the date the Executive Secretary specifies the optimal values under R309-210-6(4)(a)(vi).

(iv) Reduced monitoring

(A) A small or medium-size water system that meets the lead and copper action levels during each of two consecutive six-month monitoring periods may reduce the number of samples in accordance with R309-210-6(3)(c), Table 210-3, and reduce the frequency of sampling to once per year.

(B) Any water system that maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the Executive Secretary under R309-210-6(4)(a)(vi) during each of two consecutive six-month monitoring periods may reduce the frequency of monitoring to once per year and reduce the number of lead and copper samples in accordance with R309-210-6(3)(c), Table 210-3 if it receives written approval from the Executive Secretary. The Executive Secretary shall review monitoring, treatment, and other relevant information submitted by the water system in accordance with R309-210-6(8), and shall notify the system in writing when it determines the system is eligible to commence reduced monitoring pursuant to this paragraph. The Executive Secretary shall review, and where appropriate, revise its determination when the system submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

(C) A small or medium-size water system that meets the lead and copper action levels during three consecutive years of monitoring may reduce the frequency of monitoring for lead and copper from annually to once every three years. Any water system that maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the Executive Secretary under R309-210-6(4)(a)(vi) during three consecutive years of monitoring may reduce the frequency of monitoring from annually to once every three years if it receives written approval from the Executive Secretary. The Executive Secretary shall review monitoring, treatment, and other relevant information submitted by the water system in accordance with R309-210-6(8), and shall notify the system in writing when it determines the system is eligible to commence reduced monitoring to once every three years. The Executive Secretary shall review, and where appropriate, revise its determination when the system submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

(D) A water system that reduces the number and frequency of sampling shall collect these samples from representative sites

included in the pool of targeted sampling sites identified in R309-210-6(3)(a). Systems sampling annually or less frequently shall conduct the lead and copper tap sampling during the months of June, July, August or September unless the Executive Secretary has approved a different sampling period in accordance with paragraph (d)(iv)(D)(I) of this section.

(I) The Executive Secretary, at its discretion, may approve a different period for conducting the lead and copper sampling for systems collecting a reduced number of samples. Such a period shall be no longer than four consecutive months and must represent a time of normal operation where the highest levels of lead are most likely to occur. For a non-transient non-community water system that does not operate during the months of June through September, and for which the period of normal operation where the highest levels of lead are most likely to occur is not known, the Executive Secretary shall designate a period that represents a time of normal operation for the system.

(II) Systems monitoring annually, that have been collecting samples during the months of June through September and that receive Executive Secretary approval to alter their sample collection period under paragraph (d)(iv)(D)(I) of this section, must collect their next round of samples during a time period that ends no later than 21 months after the previous round of sampling. Systems monitoring triennially that have been collecting samples during the months of June through September, and receive Executive Secretary approval to alter the sampling collection period as per (d)(iv)(D)(I) of this section, must collect their next round of samples during a time period that ends no later than 45 months after the previous round of sampling. Subsequent rounds of sampling must be collected annually or triennially, as required by this section. Small systems with waivers, granted pursuant to paragraph (g) of this section, that have been collecting samples during the months of June through September and receive Executive Secretary approval to alter their sample collection period under paragraph (d)(iv)(D)(I) of this section must collect their next round of samples before the end of the 9 year period.

(E) Any water system that demonstrates for two consecutive 6 month monitoring periods that the tap water lead level computed under R309-200-5(2)(c) is less than or equal to 0.005 mg/L and the



tap water copper level computed under R309-200-5(2)(c) is less than or equal to 0.65 mg/L may reduce the number of samples in accordance paragraph (c) of this section and reduce the frequency of sampling to once every three calendar years.

(F)(I) A small or medium-size water system subject to reduced monitoring that exceeds the lead or copper action level shall resume sampling in accordance R309-210-6(3)(d)(iii) and collect the number of samples specified for standard monitoring under R309-210-6(3)(c), Table 210-3. Such system shall also conduct water quality parameter monitoring in accordance with R309-210-6(5)(b), (c) or (d) (as appropriate) during the monitoring period in which it exceeded the action level. Any such system may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in paragraph (c) of this section after it has completed two subsequent consecutive six month rounds of monitoring that meet the criteria of paragraph (d)(iv)(A) of this section or may resume triennial monitoring for lead and copper at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either paragraph (d)(vi)(C) or (d)(iv)(D) of this section.

(II) Any water system subject to the reduced monitoring frequency that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the Executive Secretary under R309-210-6(4)(a)(vi) for more than 9 days in any six month period specified in R309-210-6(5)(d) shall conduct tap water sampling for lead and copper at the frequency specified in paragraph (d)(iii) of this section, collect the number of samples specified for standard monitoring under paragraph (c) of this section, and shall resume monitoring for water quality parameters within the distribution system in accordance with sec R309-210-6(5)(d). Such a system may resume reduced monitoring for lead and copper at the tap and for water quality parameters within the distribution system under the following conditions:

(aa) The system may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in paragraph (c) of this section after it has completed two subsequent six month rounds of monitoring that meet the criteria of paragraph (d)(iv)(B) of this section and the system has received written approval from the Executive

Secretary that it is appropriate to resume reduced monitoring on an annual frequency.

(bb) The system may resume triennial monitoring for lead and copper at the tap at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either paragraph (d)(iv)(C) or (d)(iv)(E) of this section and the system has received written approval from the Executive Secretary that it is appropriate to resume triennial monitoring.

(cc) The system may reduce the number of water quality parameter tap water samples required in accordance with R309-210-6(5)(e)(i) and the frequency with which it collects such samples in accordance with R309-210-6(5)(e)(ii). Such a system may not resume triennial monitoring for water quality parameters at the tap until it demonstrates, in accordance with the requirements of R309-210-6(5)(e)(ii), that it has requalified for triennial monitoring.

(G) Any water system subject to a reduced monitoring frequency under paragraph (d)(iv) of this section that either adds a new source of water or changes any water treatment shall inform the Executive Secretary in writing in accordance with R309-210-6(8)(a)(iii). The Executive Secretary may require the system to resume sampling in accordance with paragraph (d)(iii) of this section and collect the number of samples specified for standard monitoring under paragraph (c) of this section or take other appropriate steps such as increased water quality parameter monitoring or re-evaluation of its corrosion control treatment given the potentially different water quality considerations.

(e) Additional monitoring by systems

The results of any monitoring conducted in addition to the minimum requirements of this section shall be considered by the system and the Executive Secretary in making any determinations (i.e., calculating the 90th percentile lead or copper level).

(f) Invalidation of lead or copper tap water samples. A sample invalidated under this paragraph does not count toward determining lead or copper 90th percentile levels under Sec. 141.80 (c) (3) or toward meeting the minimum monitoring requirements of paragraph (c) of this section.

(i) The Executive Secretary may invalidate a lead or copper tap water sample at least if one of the following conditions is met.

(A) The laboratory establishes that improper sample analysis caused erroneous results.

(B) The Executive Secretary determines that the sample was taken from a site that did not meet the site selection criteria of this section.

(C) The sample container was damaged in transit.

(D) There is substantial reason to believe that the sample was subject to tampering.

(ii) The system must report the results of all samples to the Executive Secretary and all supporting documentation for samples the system believes should be invalidated.

(iii) To invalidate a sample under paragraph (f)(i) of this section, the decision and the rationale for the decision must be documented in writing. The Executive Secretary may not invalidate a sample solely on the grounds that a follow-up sample result is higher or lower than that of the original sample.

(iv) The water system must collect replacement samples for any samples invalidated under this section if, after the invalidation of one or more samples, the system has too few samples to meet the minimum requirements of paragraph (c) of this section. Any such replacement samples must be taken as soon as possible, but no later than 20 days after the date the Executive Secretary invalidates the sample or by the end of the applicable monitoring period, whichever occurs later. Replacement samples taken after the end of the applicable monitoring period shall not also be used to meet the monitoring requirements of a subsequent monitoring period. The replacement samples shall be taken at the same locations as the invalidated samples or, if that is not possible, at locations other than those already used for sampling during the monitoring period.

(g) Monitoring waivers for small systems. Any small system that meets the criteria of this paragraph may apply to the Executive Secretary to reduce the frequency of monitoring for lead and copper under this section to once every nine years (i.e., a full waiver) if it meets all of the materials criteria specified in paragraph (g)(i) of this section and all of the monitoring criteria specified in paragraph (g) (ii) of this section. Any small system that meets the criteria in paragraphs (g) (i) and (ii) of this section only for lead, or only for copper, may

apply to the Executive Secretary for a waiver to reduce the frequency of tap water monitoring to once every nine years for that contaminant only (i.e., a partial waiver).

(i) Materials criteria. The system must demonstrate that its distribution system and service lines and all drinking water supply plumbing, including plumbing conveying drinking water within all residences and buildings connected to the system, are free of lead-containing materials and/or copper-containing materials, as those terms are defined in this paragraph, as follows:

(A) Lead. To qualify for a full waiver, or a waiver of the tap water monitoring requirements for lead (i.e., a lead waiver), the water system must provide certification and supporting documentation to the Executive Secretary that the system is free of all lead-containing materials, as follows:

(I) It contains no plastic pipes which contain lead plasticizers, or plastic service lines which contain lead plasticizers; and

(II) It is free of lead service lines, lead pipes, lead soldered pipe joints, and leaded brass or bronze alloy fittings and fixtures, unless such fittings and fixtures meet the specifications of any standard established pursuant to 42 U.S.C. 300g-6(e) (SDWA section 1417 (e)).

(B) Copper. To qualify for a full waiver, or waiver of the tap water monitoring requirements for copper (i.e., a copper waiver), the water system must provide certification and supporting documentation to the Executive Secretary that the system contains no copper pipes or copper service lines.

(ii) Monitoring criteria for waiver issuance. The system must have completed at least one 6-month round of standard tap water monitoring for lead and copper at sites approved by the Executive Secretary and from the number of sites required by paragraph (c) of this section and demonstrate that the 90th percentile levels for any and all rounds of monitoring conducted since the system became free of all lead-containing and/or copper-containing materials, as appropriate, meet the following criteria.

(A) Lead levels. To qualify for a full waiver, or a lead waiver, the system must demonstrate that the 90th percentile lead level does not exceed 0.005 mg/L.

(B) Copper levels. To qualify for a full waiver, or a copper waiver, the system must demonstrate that the 90th percentile lead level does not exceed 0.65 mg/L.

(iii) Executive Secretary approval of waiver application. The Executive Secretary shall notify the system of its waiver determination, in writing, setting forth the basis of its decision and any condition of the waiver. As a condition of the waiver, the Executive Secretary may require the system to perform specific activities (e.g., limited monitoring, periodic outreach to customers to remind them to avoid installation of materials that might void the waiver) to avoid the risk of lead or copper concentration of concern in tap water. The small system must continue monitoring for lead and copper at the tap as required by paragraphs (d) (i) through (d) (iv) of this section, as appropriate, until it receives written notification from the Executive Secretary the waiver has been approved.

(iv) Monitoring frequency for systems with waivers.

(A) A system with a full waiver must conduct tap water monitoring for lead and copper in accordance with paragraph (d)(iv)(D) of this section at the reduced number of sampling sites identified in paragraph (c) of this section at least once every nine years and provide the materials certification specified in paragraph (g)(i) of this section for both lead and copper to the Executive Secretary along with the monitoring results.

(B) A system with a partial waiver must conduct tap water monitoring for the waived contaminant in accordance with paragraph (d)(iv)(D) of this section at the reduced number of sampling sites specified in paragraph (c) of this section at least once every nine years and provide the materials certification specified in paragraph (g)(i) of this section pertaining to the waived contaminant along with the monitoring results. Such a system also must continue to monitor for the non-waived contaminant in accordance with requirements of paragraph (d)(i) through (d)(iv) of this section, as appropriate.

(C) If a system with a full or partial waiver adds a new source of water or changes any water treatment, the system must notify the Executive Secretary in writing in accordance with R309-210-6(8)(a)(iii). The Executive Secretary has the authority to require the system to add or modify waiver conditions (e.g., require recertification that the system is free of lead-containing and/or copper-containing materials, require additional round(s) of monitoring), if it deems such modifications are necessary to address treatment or source water changes at the system.

(D) If a system with a full or partial waiver becomes aware that it is no longer free of lead-containing or copper-containing materials, as appropriate, (e.g., as a result of new construction or repairs), the system shall notify the Executive Secretary in writing no later than 60 days after becoming aware of such a change.

(v) Continued eligibility. If the system continues to satisfy the requirements of paragraph (g) (iv) of this section, the waiver will be renewed automatically, unless any of the conditions listed in paragraph (g)(v)(A) through (g)(v)(C) of this section occurs. A system whose waiver has been revoked may re-apply for a waiver at such time as it again meets the appropriate materials and monitoring criteria of paragraphs (g)(i) and (g)(ii) of this section.

(A) A system with a full waiver or lead waiver no longer satisfies the materials criteria of paragraph (g)(i)(A) of this section or has a 90th percentile lead level greater than 0.005 mg/L.

(B) A system with a full waiver or a copper waiver no longer satisfies the materials criteria of paragraph (g)(i)(B) of this section or has a 90th percentile copper level greater than 0.65 mg/L.

(C) The Executive Secretary notifies the system, in writing, that the waiver has been revoked, setting forth the basis of its decision.

(vi) Requirements following waiver revocation. A system whose full or partial waiver has been revoked by the Executive Secretary is subject to the corrosion control treatment and lead and copper tap water monitoring requirements, as follows:

(A) If the system exceeds the lead and/or copper action level, the system must implement corrosion control treatment in accordance with the deadlines specified in R309-210-6(2)(e), and any other applicable requirements of this subpart.

(B) If the system meets both the lead and the copper action level, the system must monitor for lead and copper at the tap no less frequently than once every three years using the reduced number of sample sites specified in paragraph (c) of this section.

(vii) Pre-existing waivers. Small system waivers approved by the Executive Secretary in writing prior to April 11, 2000 shall remain in effect under the following conditions:

(A) If the system has demonstrated that it is both free of lead-containing and copper-containing materials, as required by paragraph (g)(i) of this section and that its 90th percentile lead levels and 90th percentile copper levels meet the criteria of paragraph (g)(ii) of this section, the waiver remains in effect so long as the system continues to meet the waiver eligibility criteria of paragraph (g)(v) of this section. The first round of tap water monitoring conducted pursuant to paragraph (g)(iv) of this section shall be completed no later than nine years after the last time the system has monitored for lead and copper at the tap.

(B) If the system has met the materials criteria of paragraph (g)(i) of this section but has not met the monitoring criteria of paragraph (g)(ii) of this section, the system shall conduct a round of monitoring for lead and copper at the tap demonstrating that it meets the criteria of paragraph (g)(ii) of this section no later than September 30, 2000. Thereafter, the waiver shall remain in effect as long as the system meets the continued eligibility criteria of paragraph (g)(v) of this section. The first round of tap water monitoring conducted pursuant to paragraph (g)(iv) of this section shall be completed no later than nine years after the round of monitoring conducted pursuant to paragraph (g)(ii) of this section.

#### **(4) Corrosion Control for Control of Lead and Copper**

(a) Description of corrosion control treatment requirements.

Each system shall complete the corrosion control treatment requirements described below which are applicable to such system under R309-210-6(2).

(i) System recommendation regarding corrosion control treatment

Based upon the results of lead and copper tap monitoring and water quality parameter monitoring, small and medium-size water systems exceeding the lead or copper action level shall recommend installation of one or more of the corrosion control treatments listed in R309-210-6(4)(a)(iii)(A) which the system believes constitutes optimal corrosion control for that system. The Executive Secretary may require the system to conduct additional water quality parameter monitoring in accordance with R309-210-6(5)(b) to assist the Executive Secretary in reviewing the system's recommendation.

(ii) Studies of corrosion control treatment required for small and medium-size systems.

The Executive Secretary may require any small or medium-size system that exceeds the lead or copper action level to perform corrosion control studies under R309-210-6(4)(a)(iii) to identify optimal corrosion control treatment for the system.

(iii) Performance of corrosion control studies

(A) Any public water system performing corrosion control studies shall evaluate the effectiveness of each of the following treatments, and, if appropriate, combinations of the following treatments to identify the optimal corrosion control treatment for that system:

(I) alkalinity and pH adjustment;

(II) calcium hardness adjustment; and

(III) the addition of a phosphate or silicate based corrosion inhibitor at a concentration sufficient to maintain an effective residual concentration in all test tap samples.

(B) The water system shall evaluate each of the corrosion control treatments using either pipe rig/loop tests, metal coupon tests, partial-system tests, or analyses based on documented analogous treatments with other systems of similar size, water chemistry and distribution system configuration.

(C) The water system shall measure the following water quality parameters in any tests conducted under this paragraph before and after evaluating the corrosion control treatments listed above:

(I) lead;

(II) copper;

(III) pH;

(IV) alkalinity;

(V) calcium;

(VI) conductivity;

(VII) orthophosphate (when an inhibitor containing a phosphate compound is used);



(VIII) silicate (when an inhibitor containing a silicate compound is used);

(IX) water temperature.

(D) The water system shall identify all chemical or physical constraints that limit or prohibit the use of a particular corrosion control treatment and document such constraints with at least one of the following:

(I) data and documentation showing that a particular corrosion control treatment has adversely affected other water treatment processes when used by another water system with comparable water quality characteristics; and/or

(II) data and documentation demonstrating that the water system has previously attempted to evaluate a particular corrosion control treatment and has found that the treatment is ineffective or adversely affects other water quality treatment processes.

(E) The water system shall evaluate the effect of the chemicals used for corrosion control treatment on other water quality treatment processes.

(F) On the basis of an analysis of the data generated during each evaluation, the water system shall recommend to the Executive Secretary in writing the treatment option that the corrosion control studies indicate constitutes optimal corrosion control treatment for that system. The water system shall provide a rationale for its recommendation along with all supporting documentation specified in R309-210-6(4)(a)(iii)(A) through R309-210-6(4)(a)(iii)(E).

(iv) Designation of optimal corrosion control treatment

(A) Based upon consideration of available information including, where applicable, studies performed under R309-210-6(4)(a)(iii) and a system's recommended treatment alternative, the Executive Secretary shall either approve the corrosion control treatment option recommended by the system, or designate alternative corrosion control treatment(s) from among those listed in R309-210-6(4)(a)(iii)(A). When designating optimal treatment the Executive Secretary shall consider the effects that additional

corrosion control treatment will have on water quality parameters and on other water quality treatment processes.

(B) The Executive Secretary shall notify the system of its decision on optimal corrosion control treatment in writing and explain the basis for this determination. If the Executive Secretary requests additional information to aid its review, the water system shall provide the information.

(v) Installation of optimal corrosion control

Each system shall properly install and operate throughout its distribution system the optimal corrosion control treatment designated by the Executive Secretary under R309-210-6(4)(a)(iv).

(vi) Review of treatment and specification of optimal water quality control parameters

The Executive Secretary shall evaluate the results of all lead and copper tap samples and water quality parameter samples submitted by the water system and determine whether the system has properly installed and operated the optimal corrosion control treatment designated by the Executive Secretary in R309-210-6(4)(a)(iv). Upon reviewing the results of tap water and water quality parameter monitoring by the system, both before and after the system installs optimal corrosion control treatment, the Executive Secretary shall designate:

(A) A minimum value or a range of values for pH measured at each entry point to the distribution system;

(B) A minimum pH value, measured in all tap samples. Such value shall be equal to or greater than 7.0, unless the Executive Secretary determines that meeting a pH level of 7.0 is not technologically feasible or is not necessary for the system to optimize corrosion control;

(C) If a corrosion inhibitor is used, a minimum concentration or a range of concentrations for the inhibitor, measured at each entry point to the distribution system and in all tap samples, that the Executive Secretary determines is necessary to form a passivating film on the interior walls of the pipes of the distribution system;

(D) If alkalinity is adjusted as part of optimal corrosion control treatment, a minimum concentration or a range of concentrations for alkalinity, measured at each entry point to the distribution system and in all tap samples;

(E) If calcium carbonate stabilization is used as part of corrosion control, a minimum concentration or a range of concentrations for calcium, measured in all tap samples.

The values for the applicable water quality control parameters listed above shall be those that the Executive Secretary determines to reflect optimal corrosion control treatment for the system. The Executive Secretary may designate values for additional water quality control parameters determined by the Executive Secretary to reflect optimal corrosion control for the system. The Executive Secretary shall notify the system in writing of these determinations and explain the basis for the decisions.

(vii) Continued operation and monitoring. All systems optimizing corrosion control shall continue to operate and maintain optimal corrosion control treatment, including maintaining water quality parameters at or above minimum values or within ranges designated by the Executive Secretary under paragraph (vi) of this section, in accordance with this paragraph for all samples collected under R309-210-6(5)(d) through (f). Compliance with the requirements of this paragraph shall be determined every six months, as specified under R309-210-6(5)(d). A water system is out of compliance with the requirements of this paragraph for a six-month period if it has excursions for any Executive Secretary specified parameter on more than nine days during the period. An excursion occurs whenever the daily value for one or more of the water quality parameters measured at a sampling location is below the minimum value or outside the range designated by the Executive Secretary. Daily values are calculated as follows. The Executive Secretary has discretion to delete results of obvious sampling errors from this calculation.

(A) On days when more than one measurement for the water quality parameter is collected at the sampling location, the daily value shall be the average of all results collected during the day regardless of whether they are collected through continuous monitoring, grab sampling, or combination of both.

(B) On days when only one measurement for the water quality parameter is collected at the sampling location, the daily value shall be the result of that measurement.

(C) On days when no measurement is collected for the water quality parameter at the sampling location, the daily value shall be the daily value calculated on the most recent day on which the water quality parameter was measured at the sample site.

(viii) Modification of treatment decisions

Upon its own initiative or in response to a request by a water system or other interested party, the Executive Secretary may modify its determination of the optimal corrosion control treatment under R309-210-6(4)(a)(iv) or optimal water quality control parameters under R309-210-6(4)(a)(vi). A request for modification by a system or other interested party shall: be in writing, explain why the modification is appropriate, and provide supporting documentation. The Executive Secretary may modify its determination where it concludes that such change is necessary to ensure that the system continues to optimize corrosion control treatment. A revised determination shall: be made in writing, set forth the new treatment requirements, explain the basis for the Executive Secretary's decision, and provide an implementation schedule for completing the treatment modifications.

(b) Source water treatment requirements.

Systems shall complete the applicable source water monitoring and treatment requirements (described in the referenced portions of R309-210-6(4)(b)(ii), and in R309-210-6(3), and R309-210-6(6)) by the following deadlines.

(i) Deadlines for Completing Source Water Treatment Steps

(A) Step 1: A system exceeding the lead or copper action level shall complete lead and copper source water monitoring (R309-210-6(6)(b)) and make a treatment recommendation to the Executive Secretary (R309-210-6(4)(b)(ii)(A)) within 6 months after exceeding the lead or copper action level.

(B) Step 2: The Executive Secretary shall make a determination regarding source water treatment (R309-210-6(4)(b)(ii)(B)) within 6 months after submission of monitoring results under step 1.

(C) Step 3: If the Executive Secretary requires installation of source water treatment, the system shall install the treatment (R309-210-6(4)(b)(ii)(C)) within 24 months after completion of step 2.

(D) Step 4: The system shall complete follow-up tap water monitoring (R309-210-6(3)(d)(ii)) and source water monitoring (R309-210-6(6)(c)) within 36 months after completion of step 2.

(E) Step 5: The Executive Secretary shall review the system's installation and operation of source water treatment and specify

maximum permissible source water levels (R309-210-6(4)(b)(ii)(D)) within 6 months after completion of step 4.

(F) Step 6: The system shall operate in compliance with the Executive Secretary specified maximum permissible lead and copper source water levels (R309-210-6(4)(b)(ii)(D)) and continue source water monitoring (R309-210-6(6)(d)).

(ii) Description of Source Water Treatment Requirements

(A) System treatment recommendation

Any system which exceeds the lead or copper action level shall recommend in writing to the Executive Secretary the installation and operation of one of the source water treatments listed in R309-210-6(4)(b)(ii)(B). A system may recommend that no treatment be installed based upon a demonstration that source water treatment is not necessary to minimize lead and copper levels at users' taps.

(B) Determination regarding source water treatment

The Executive Secretary shall complete an evaluation of the results of all source water samples submitted by the water system to determine whether source water treatment is necessary to minimize lead or copper levels in water delivered to users' taps. If the Executive Secretary determines that treatment is needed, the Executive Secretary shall either require installation and operation of the source water treatment recommended by the system (if any) or require the installation and operation of another source water treatment from among the following: ion exchange, reverse osmosis, lime softening or coagulation/filtration. If the Executive Secretary requests additional information to aid in its review, the water system shall provide the information by the date specified by the Executive Secretary in its request. The Executive Secretary shall notify the system in writing of its determination and set forth the basis for its decision.

(C) Installation of source water treatment

Each system shall properly install and operate the source water treatment designated by the Executive Secretary under R309-210-6(4)(b)(ii)(B).

(D) Review of source water treatment and specification of maximum permissible source water levels

The Executive Secretary shall review the source water samples taken by the water system both before and after the system installs source water treatment, and determine whether the system has properly installed and operated the source water treatment designated by the Executive Secretary. Based upon its review, the Executive Secretary shall designate the maximum permissible lead and copper concentrations for finished water entering the distribution system. Such levels shall reflect the contaminant removal capability of the treatment properly operated and maintained. The Executive Secretary shall notify the system in writing and explain the basis for its decision.

(E) Continued operation and maintenance

Each water system shall maintain lead and copper levels below the maximum permissible concentrations designated by the Executive Secretary at each sampling point monitored in accordance with R309-210-6(6). The system is out of compliance with this paragraph if the level of lead or copper at any sampling point is greater than the maximum permissible concentration designated by the Executive Secretary.

(F) Modification of treatment decisions

Upon its own initiative or in response to a request by a water system or other interested party, the Executive Secretary may modify its determination of the source water treatment under R309-210-6(4)(b)(ii)(B), or maximum permissible lead and copper concentrations for finished water entering the distribution system under R309-210-6(4)(b)(ii)(D). A request for modification by a system or other interested party shall: be in writing, explain why the modification is appropriate, and provide supporting documentation. The Executive Secretary may modify the determination where it concludes that such change is necessary to ensure that the system continues to minimize lead and copper concentrations in source water. A revised determination shall: be made in writing, set forth the new treatment requirements, explain the basis for the Executive Secretary's decision, and provide an implementation schedule for completing the treatment modifications.

(c) Lead service line replacement requirements.

- (i) Systems that fail to meet the lead action level in tap samples taken pursuant to R309-210-6(3)(d)(ii), after installing corrosion control and/or source water treatment (whichever sampling occurs later), shall replace

lead service lines in accordance with the requirements of this section. If a system is in violation of R309-210-6(2) or R309-210-6(4)(b) for failure to install source water or corrosion control treatment, the Executive Secretary may require the system to commence lead service line replacement under this section after the date by which the system was required to conduct monitoring under R309-104-4.2.3.d.2. has passed.

(ii) A system shall replace annually at least 7 percent of the initial number of lead service lines in its distribution system. The initial number of lead service lines is the number of lead lines in place at the time the replacement program begins. The system shall identify the initial number of lead service lines in its distribution system, including an identification of the portion(s) owned by the system, based upon a materials evaluation, including the evaluation required under R309-210-6(3)(a) and relevant legal authorities (e.g., contracts, local ordinances) regarding the portion owned by the system. The first year of lead service line replacement shall begin on the date the action level was exceeded in tap sampling referenced in R309-210-6(4)(c)(i).

(iii) A system is not required to replace an individual lead service line if the lead concentration in all service line samples from that line, taken pursuant to R309-210-6(3)(b)(iii), is less than or equal to 0.015 mg/L.

(iv) A water system shall replace that portion of the lead service line that it owns. In cases where the system does not own the entire lead service line, the system shall notify the owner of the line, or the owner's authorized agent, that the system will replace the portion of the service line that it owns and shall offer to replace the owner's portion of the line. A system is not required to bear the cost of replacing the privately-owned portion of the line, nor is it required to replace the privately-owned portion where the owner chooses not to pay the cost of replacing the privately owned portion of the line, or where replacing the privately-owned portion would be precluded by State, local or common law. A water system that does not replace the entire length of the service line also shall complete the following tasks.

(A) At least 45 days prior to commencing with the partial replacement of a lead service line, the water system shall provide notice to the resident(s) of all buildings served by the line explaining that they may experience a temporary increase of lead levels in their drinking water, along with guidance on measures consumers can take to minimize their exposure to lead. The Executive Secretary may allow the water system to provide notice under the previous sentence less than 45 days prior to commencing partial lead service line replacement where such replacement is in conjunction with emergency repairs. In addition, the water system

shall inform the resident(s) served by the line that the system will, at the system's expense, collect a sample from each partially-replaced lead service line that is representative of the water in the service line for analysis of lead content, as prescribed under R309-210-6(3)(b)(iii), within 72 hours after the completion of the partial replacement of the service line. The system shall collect the sample and report the results of the analysis to the owner and the resident(s) served by the line within three business days of receiving the results. Mailed notices post-marked within three business days of receiving the results shall be considered on time.

(B) The water system shall provide the information required by paragraph (c)(iv)(A) of this section to the residents of individual dwellings by mail or by other methods approved by the Executive Secretary. In instances where multi-family dwellings are served by the line, the water system shall have the option to post the information at a conspicuous location.

(v) The Executive Secretary shall require a system to replace lead service lines on a shorter schedule than that required by this section, taking into account the number of lead service lines in the system, where such a shorter replacement schedule is feasible. The Executive Secretary shall make this determination in writing and notify the system of its finding within 6 months after the system is triggered into lead service line replacement based on monitoring referenced in R309-210-6(4)(c)(i).

(vi) Any system may cease replacing lead service lines whenever first draw samples collected pursuant to R309-210-6(3)(b)(ii) meet the lead action level during each of two consecutive monitoring periods and the system submits the results to the Executive Secretary. If first draw tap samples collected in any such water system thereafter exceeds the lead action level, the system shall recommence replacing lead service lines, pursuant to R309-210-6(4)(c)(ii).

(vii) To demonstrate compliance with R309-210-6(4)(c)(i) through R309-210-6(4)(c)(iv), a system shall report to the Executive Secretary the information specified in R309-210-6(8)(e).

## **(5) Monitoring requirements for water quality parameters.**

All large water systems and all small and medium-size systems that exceed the lead or copper action level shall monitor water quality parameters in addition to lead and copper in accordance with this section.

### **(a) General Requirements**



(i) Sample collection methods

(A) Tap samples shall be representative of water quality throughout the distribution system taking into account the number of persons served, the different sources of water, the different treatment methods employed by the system, and seasonal variability. Tap sampling under this section is not required to be conducted at taps targeted for lead and copper sampling under R309-210-6(3)(a).

(B) Samples collected at the entry point(s) to the distribution system shall be from locations representative of each source after treatment. If a system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

(ii) Number of samples

(A) Systems shall collect two tap samples for applicable water quality parameters during each monitoring period specified under R309-210-6(5)(b) through R309-210-6(5)(e) from the following number of sites in Table 210-5.

TABLE 210-5 NUMBER OF WATER QUALITY PARAMETER SAMPLE SITES	
System Size (# of People Served)	# of Sites For Water Quality Parameters
Greater than 100,000	25
10,001-100,000	10
3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
100 or less	1

(B) Except as provided in paragraph (c)(iii) of this section, Systems shall collect two samples for each applicable water quality parameter at each entry point to the distribution system during each monitoring period specified in R309-210-6(5)(b). Systems shall collect one sample for each applicable water quality parameter at each entry point to the distribution system during each monitoring period specified in R309-210-6(5)(c) through R309-210-6(5)(e).

(b) Initial Sampling

All large water systems shall measure the applicable water quality parameters as specified below at taps and at each entry point to the distribution system during each six-month monitoring period specified in R309-210-6(3)(d)(i). All small and medium-size systems shall measure the applicable water quality parameters at the locations specified below during each six-month monitoring period specified in R309-210-6(3)(d)(i) during which the system exceeds the lead or copper action level.

(i) At taps:

(A) pH;

(B) alkalinity;

(C) orthophosphate, when an inhibitor containing a phosphate compound is used;

(D) silica, when an inhibitor containing a silicate compound is used;

(E) calcium;

(F) conductivity; and

(G) water temperature.

(ii) At each entry point to the distribution system: all of the applicable parameters listed in R309-210-6(5)(b)(i).

(c) Monitoring after installation of corrosion control

Any large system which installs optimal corrosion control treatment pursuant to R309-210-6(2)(d)(iv) shall measure the water quality parameters at the locations and frequencies specified below during each six-month monitoring period specified in R309-210-6(3)(d)(ii)(A). Any small or medium-size system which installs optimal corrosion control treatment shall conduct such monitoring during each six-month monitoring period specified in R309-210-6(3)(d)(ii)(B) in which the system exceeds the lead or copper action level.

(i) At taps, two samples for:

(A) pH;

(B) alkalinity;

(C) orthophosphate, when an inhibitor containing a phosphate compound is used;

(D) silica, when an inhibitor containing a silicate compound is used;

(E) calcium, when calcium carbonate stabilization is used as part of corrosion control.

(ii) Except as provided in Paragraph (c)(iii) of this section, at each entry point to the distribution system, at least on sample no less frequently than every two weeks (bi-weekly) for:

(A) pH;

(B) when alkalinity is adjusted as part of optimal corrosion control, a reading of the dosage rate of the chemical used to adjust alkalinity, and the alkalinity concentration; and

(C) when a corrosion inhibitor is used as part of optimal corrosion control, a reading of the dosage rate of the inhibitor used, and the concentration of orthophosphate or silica (whichever is applicable).

(iii) Any ground water system can limit entry point sampling described in paragraph (c)(ii) of this section to those entry points that are representative of water quality and treatment conditions throughout the system. If water from untreated ground water sources mixes with water from treated ground water sources, the system must monitor for water quality parameters both at representative entry points receiving treatment and representative entry points receiving no treatment. Prior to the start of any monitoring under this paragraph, the system shall provide to the Executive Secretary written information identifying the selected entry points and documentation, including information on seasonal variability, sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the system.

(d) Monitoring after Executive Secretary specifies water quality parameter values for optimal corrosion control.

After the Executive Secretary specifies the values for applicable water quality control parameters reflecting optimal corrosion control treatment under R309-210-6(4)(a)(vi), all large systems shall measure the applicable water quality parameters in accordance with paragraph (c) of this section and determine compliance with the requirements of R309-210-6(4)(a)(vii) every six months with the first six month period to begin on the date the Executive Secretary specifies

the optimal values under R309-210-6(4)(a)(vi). Any small or medium size system shall conduct such monitoring during each six month period specified in this paragraph in which the system exceeds the lead or copper action level. For any such small and medium size system that is subject to a reduced monitoring frequency pursuant to R309-210-6(3)(d)(iv) at the time of the action level exceedance, the end of the applicable six month monitoring period under R309-210-6(3)(d)(iv). Compliance with Executive Secretary designated optimal water quality parameter values shall be determined as specified under R309-210-6(4)(a)(vii).

(e) Reduced monitoring

(i) Any water system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment during each of two consecutive six-month monitoring periods under R309-210-6(5)(d) shall continue monitoring at the entry point(s) to the distribution system as specified in R309-210-6(5)(c)(ii). Such system may collect two tap samples for applicable water quality parameters from the following reduced number of sites in Table 210-6 during each six-month monitoring period.

TABLE 210-6 REDUCED NUMBER OF WATER QUALITY PARAMETER SAMPLE SITES	
System Size (# People Served)	Reduced # of Sites for Water Quality Parameters
Greater than 100,000	10
10,001 to 100,000	7
3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
100 or less	1

(ii)(A) Any water system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the Executive Secretary under R309-210-6(4)(a)(vi) during three consecutive years of monitoring may reduce the frequency with which it collects the number of tap samples for applicable water quality parameters specified in R309-210-6(5)(e)(i), Table 210-6, from every six months to annually. Any water system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the Executive Secretary under R309-210-6(4)(a)(vi) during three consecutive years of annual monitoring may reduce the frequency with which it collects the number of tap samples for applicable water quality parameters specified in R309-210-6(5)(e)(i), Table 210-6, from annually to every three years.

(B) A water system may reduce the frequency with which it collects tap samples for applicable water quality parameters specified in paragraph (e)(i) of this section to every three years if it demonstrates during two consecutive monitoring periods that its tap water lead level at the 90th percentile is less than or equal to the PQL for lead specified in R309-200-4(3), that its tap water copper level at the 90th percentile is less than or equal to 0.65 mg/L for copper in R309-200-5(2)(c), and that it also has maintained the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the Executive Secretary under R309-210-6(4)(a)(vi).

(iii) A water system that conducts sampling annually shall collect these samples evenly throughout the year so as to reflect seasonal variability.

(iv) Any water system subject to the reduced monitoring frequency that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the Executive Secretary in R309-210-6(4)(a)(vi) for more than 9 days in any six month period specified in R309-210-6(4)(a)(vii) shall resume distribution system tap water sampling in accordance with the number and frequency requirements in paragraph (d) of this section. Such a system may resume annual monitoring for water quality parameters at the tap at the reduced number of sites specified in paragraph (e)(i) of this section after it has completed two subsequent consecutive six month rounds of monitoring that meet the criteria of that paragraph or may resume triennial monitoring for water quality parameters at the tap at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either paragraph (e)(ii)(A) or (e)(ii)(B) of this section.

(f) Additional monitoring by systems

The results of any monitoring conducted in addition to the minimum requirements of this section shall be considered by the system and the Executive Secretary in making any determinations (i.e., determining concentrations of water quality parameters) under this section or R309-210-6(4)(a).

(g) The Executive Secretary has the authority to allow the use of previously collected monitoring data for purposes of monitoring, if the data were collected in accordance with this section and analyzed in accordance with R309-104-8.

## **(6) Monitoring requirements for lead and copper in source water.**

(a) Sample location, collection methods, and number of samples

(i) A water system that fails to meet the lead or copper action level on the basis of tap samples collected in accordance with R309-210-6(3) shall collect lead and copper source water samples in accordance with the following requirements regarding sample location, number of samples, and collection methods:

(A) Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). The system shall take one sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

(B) Surface water systems shall take a minimum of one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source after treatment (hereafter called a sampling point). The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant. For purposes of this paragraph, surface water systems include systems with a combination of surface and ground sources.

(C) If a system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

(D) The Executive Secretary may reduce the total number of samples which must be analyzed by allowing the use of compositing. Compositing of samples must be done by certified laboratory personnel. Composite samples from a maximum of five samples are allowed, provided that if the lead concentration in the composite sample is greater than or equal to 0.001 mg/L or the copper concentration is greater than or equal to 0.160 mg/L, then either:

(I) A follow up sample shall be taken and analyzed within 14 days at each sampling point included in the composite; or

(II) If duplicates of or sufficient quantities from the original samples from each sampling point used in the

composite are available, the system may use these instead of resampling.

(ii) Where the results of sampling indicate an exceedance of maximum permissible source water levels established under R309-210-6(4)(b)(ii)(D), the Executive Secretary may require that one additional sample be collected as soon as possible after the initial sample was taken (but not to exceed two weeks) at the same sampling point. If a confirmation sample is taken for lead or copper, then the results of the initial and confirmation sample shall be averaged in determining compliance with the specified maximum permissible levels. Any sample value below the detection limit shall be considered to be zero. Any value above the detection limit but below the PQL shall either be considered as the measured value or be considered one-half the PQL.

(b) Monitoring frequency after system exceeds tap water action level.

Any system which exceeds the lead or copper action level at the tap shall collect one source water sample from each entry point to the distribution system within six months after the exceedance.

(c) Monitoring frequency after installation of source water treatment.

Any system which installs source water treatment pursuant to R309-210-6(4)(b)(i)(C) shall collect an additional source water sample from each entry point to the distribution system during two consecutive six-month monitoring periods by the deadline specified in R309-210-6(4)(b)(i)(D).

(d) Monitoring frequency after Executive Secretary specifies maximum permissible source water levels or determines that source water treatment is not needed

(i) A system shall monitor at the frequency specified below in cases where the Executive Secretary specifies maximum permissible source water levels under R309-210-6(4)(b)(ii)(D) or determines that the system is not required to install source water treatment under R309-210-6(4)(b)(ii)(B).

(A) A water system using only groundwater shall collect samples once during the three-year compliance period in effect when the applicable determination under R309-210-6(6)(d)(i) is made. Such systems shall collect samples once during each subsequent compliance period.

(B) A water system using surface water (or a combination of surface and groundwater) shall collect samples once during each

year, the first annual monitoring period to begin on the date on which the applicable determination is made under R309-210-6(6)(d)(i).

(ii) A system is not required to conduct source water sampling for lead and/or copper if the system meets the action level for the specific contaminant in tap water samples during the entire source water sampling period applicable to the system under R309-210-6(6)(d)(i)(A) or (B).

(e) Reduced monitoring frequency

(i) A water system using only ground water may reduce the monitoring frequency for lead and copper in source water to once during each nine year compliance cycle, as defined in R309-110, if the system meets one of the following criteria:

(A) The system demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the Executive Secretary in R309-210-6(4)(b)(ii)(D) during at least three consecutive compliance periods under paragraph (d)(i) of this section; or

(B) The Executive Secretary has determined that source water treatment is not needed and the system demonstrates that, during at least three consecutive compliance periods in which sampling was conducted under paragraph (d)(i) of this section, the concentration of lead in source water was less than or equal to 0.005 mg/L and the concentration of copper in source water was less than or equal to 0.65 mg/L.

(ii) A water system using surface water (or a combination of surface water and ground water) may reduce the monitoring frequency in paragraph (d)(i) of this section to once during each nine year compliance cycle, as defined in R309-110, if the system meets one of the following criteria:

(A) The system demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the Executive Secretary in R309-210-6(4)(b)(ii)(D) for at least three consecutive years; or

(B) The Executive Secretary has determined that source water treatment is not needed and the system demonstrates that, during at least three consecutive years, the concentration of lead in source



water was less than or equal to 0.005 mg/L and the concentration of copper in source water was less than or equal to 0.65 mg/L.

(iii) A water system that uses a new source of water is not eligible for reduced monitoring for lead and/or copper until concentrations in samples collected from the new source during three consecutive monitoring periods are below the maximum permissible lead and copper concentrations specified by the Executive Secretary in R309-210-6(4)(b)(i)(E).

(iv) The Executive Secretary has the authority to allow the use of previously collected monitoring data for purposes of monitoring, if the data were collected in accordance with this section and analyzed in accordance with R309-104-8.

## **(7) Public education and supplemental monitoring requirements.**

A water system that exceeds the lead action level based on tap water samples collected in accordance with R309-210-6(3) shall deliver the public education materials contained in R309-210-6(7)(a) and (b) in accordance with the requirements in R309-210-6(7)(c).

### **(a) Content of written materials.**

(i) Community water systems. A community water system shall include the following text in all of the printed materials it distributes through its lead public education program. Systems may delete information pertaining to lead service lines, upon approval by the Executive Secretary, if no lead service lines exist anywhere in the water system service area. Public education language at paragraphs (a)(1)(iv)(B)(5) and (a)(1)(iv)(D)(2) of this section may be modified regarding building permit record availability and consumer access to these records, if approved by the Executive Secretary. Systems may also continue to utilize pre-printed materials that meet the public education language requirements in R309-210-6(7). Any additional information presented by a system shall be consistent with the information below and be in plain English that can be understood by lay people.

#### **(A) INTRODUCTION**

The United States Environmental Protection Agency (EPA) and (insert name of water supplier) are concerned about lead in your drinking water. Although most homes have very low levels of lead in their drinking water, some homes in the community have lead levels above the EPA action level of 15 parts per billion (ppb), or 0.015 milligrams of lead per liter of water (mg/L). Under Federal

law we are required to have a program in place to minimize lead in your drinking water by (insert date when corrosion control will be completed for your system). This program includes corrosion control treatment, source water treatment, and public education. We are also required to replace each lead service line that we control if the line contributes lead concentrations of more than 15 ppb after we have completed the comprehensive treatment program. If you have any questions about how we are carrying out the requirements of the lead regulation please give us a call at (insert water system's phone number). This brochure explains the simple steps you can take to protect you and your family by reducing your exposure to lead in drinking water.

## (B) HEALTH EFFECTS OF LEAD

Lead is a common metal found throughout the environment in lead-based paint, air, soil, household dust, food, certain types of pottery porcelain and pewter, and water. Lead can pose a significant risk to your health if too much of it enters your body. Lead builds up in the body over many years and can cause damage to the brain, red blood cells and kidneys. The greatest risk is to young children and pregnant women. Amounts of lead that won't hurt adults can slow down normal mental and physical development of growing bodies. In addition, a child at play often comes into contact with sources of lead contamination -- like dirt and dust -- that rarely affect an adult. It is important to wash children's hands and toys often, and to try to make sure they only put food in their mouths.

## (C) LEAD IN DRINKING WATER

(I) Lead in drinking water, although rarely the sole cause of lead poisoning, can significantly increase a person's total lead exposure, particularly the exposure of infants who drink baby formulas and concentrated juices that are mixed with water. The EPA estimates that drinking water can make up 20 percent or more of a person's total exposure to lead.

(II) Lead is unusual among drinking water contaminants in that it seldom occurs naturally in water supplies like rivers and lakes. Lead enters drinking water primarily as a result of the corrosion, or wearing away, of materials containing lead in the water distribution system and household plumbing. These materials include lead-based solder used to join copper pipe, brass and chrome plated brass faucets,

and in some cases, pipes made of lead that connect your house to the water main (service lines). In 1986, Congress banned the use of lead solder containing greater than 0.2% lead, and restricted the lead content of faucets, pipes and other plumbing materials to 8.0%.

(III) When water stands in lead pipes or plumbing systems containing lead for several hours or more, the lead may dissolve into your drinking water. This means the first water drawn from the tap in the morning, or later in the afternoon after returning from work or school, can contain fairly high levels of lead.

#### **(D) STEPS YOU CAN TAKE IN THE HOME TO REDUCE EXPOSURE TO LEAD IN DRINKING WATER**

(I) Despite our best efforts mentioned earlier to control water corrosivity and remove lead from the water supply, lead levels in some homes or buildings can be high. To find out whether you need to take action in your own home, have your drinking water tested to determine if it contains excessive concentrations of lead. Testing the water is essential because you cannot see, taste, or smell lead in drinking water. Some local laboratories that can provide this service are listed at the end of this booklet. For more information on having your water tested, please call (insert phone number of water system).

(II) If a water test indicates that the drinking water drawn from a tap in your home contains lead above 15 ppb, then you should take the following precautions:

(aa) Let the water run from the tap before using it for drinking or cooking any time the water in a faucet has gone unused for more than six hours. The longer water resides in your home's plumbing the more lead it may contain. Flushing the tap means running the cold water faucet until the water gets noticeably colder, usually about 15-30 seconds. If your house has a lead service line to the water main, you may have to flush the water for a longer time, perhaps one minute, before drinking. Although toilet flushing or showering flushes water through a portion of your home's plumbing system, you still need to flush the water in each faucet before using it for drinking or cooking. Flushing

tap water is a simple and inexpensive measure you can take to protect your family's health. It usually uses less than one or two gallons of water and costs less than (insert a cost estimate based on flushing two times a day for 30 days) per month. To conserve water, fill a couple of bottles for drinking water after flushing the tap, and whenever possible use the first flush water to wash the dishes or water the plants. If you live in a high-rise building, letting the water flow before using it may not work to lessen your risk from lead. The plumbing systems have more, and sometimes larger pipes than smaller buildings. Ask your landlord for help in locating the source of the lead and for advice on reducing the lead level.

(bb) Try not to cook with, or drink water from the hot water tap. Hot water can dissolve more lead more quickly than cold water. If you need hot water, draw water from the cold tap and heat it on the stove.

(cc) Remove loose lead solder and debris from the plumbing materials installed in newly constructed homes, or homes in which the plumbing has recently been replaced, by removing the faucet strainers from all taps and running the water from 3 to 5 minutes. Thereafter, periodically remove the strainers and flush out any debris that has accumulated over time.

(dd) If your copper pipes are joined with lead solder that has been installed illegally since it was banned in 1986, notify the plumber who did the work and request that he or she replace the lead solder with lead-free solder. Lead solder looks dull gray, and when scratched with a key looks shiny. In addition, notify your local plumbing inspector and the Utah Department of Commerce about the violation.

(ee) Determine whether or not the service line that connects your home or apartment to the water main is made of lead. The best way to determine if your service line is made of lead is by either hiring a licensed plumber to inspect the line or by contacting

the plumbing contractor who installed the line. You can identify the plumbing contractor by checking the city's record of building permits which should be maintained in the files of the (insert name of department that issues building permits). A licensed plumber can at the same time check to see if your home's plumbing contains lead solder, lead pipes, or pipe fittings that contain lead. The public water system that delivers water to your home should also maintain records of the materials located in the distribution system. If the service line that connects your dwelling to the water main contributes more than 15 ppb to drinking water, after our comprehensive treatment program is in place, we are required to replace the portion of the line we own. If the line is only partially owned by the (insert name of the city, county, or water system that owns the line), we are required to provide the owner of the privately-owned portion of the line with information on how to replace the privately-owned portion of the service line, and offer to replace that portion of the line at owner's expense. If we replace only the portion of the line that we own, we also are required to notify you in advance and provide you with information on the steps you can take to minimize exposure to any temporary increase in lead levels that may result from the partial replacement, to take a follow-up sample at our expense from the line within 72 hours after the partial replacement, and to mail or otherwise provide you with the results of that sample within three business days of receiving the results. Acceptable replacement alternatives include copper, steel, iron, and plastic pipes.

(ff) Have an electrician check your wiring. If grounding wires from the electrical system are attached to your pipes, corrosion may be greater. Check with a licensed electrician or your local electrical code to determine if your wiring can be grounded elsewhere. DO NOT attempt to change the wiring yourself because improper grounding can cause electrical shock and fire hazards.

(III) The steps described above will reduce the lead concentrations in your drinking water. However, if a water

test indicates that the drinking water coming from your tap contains lead concentrations in excess of 15 ppb after flushing, or after we have completed our actions to minimize lead levels, then you may want to take the following additional measures:

(aa) Purchase or lease a home treatment device. Home treatment devices are limited in that each unit treats only the water that flows from the faucet to which it is connected, and all of the devices require periodic maintenance and replacement. Devices such as reverse osmosis systems or distillers can effectively remove lead from your drinking water. Some activated carbon filters may reduce lead levels at the tap, however all lead reduction claims should be investigated. Be sure to check the actual performance of a specific home treatment device before and after installing the unit.

(bb) Purchase bottled water for drinking and cooking.

(IV) You can consult a variety of sources for additional information. Your family doctor or pediatrician can perform a blood test for lead and provide you with information about the health effects of lead. State and local government agencies that can be contacted include:

(aa) (insert the name of city or county department of public utilities) at (insert phone number) can provide you with information about your community's water supply, and a list of local laboratories that have been certified by EPA for testing water quality;

(bb) (insert the name of city or county department that issues building permits) at (insert phone number) can provide you with information about building permit records that should contain the names of plumbing contractors that plumbed your home; and

(cc) The Utah Division of Drinking Water at 536-4200 or the (insert the name of the city or county health department) at (insert phone number) can provide you with information about the health

effects of lead and how you can have your child's blood tested.

(V) The following is a list of some Utah Division of Drinking Water approved laboratories in your area that you can call to have your water tested for lead. (Insert names and phone numbers of at least two laboratories).

(ii) Non-transient non-community water systems. A non-transient non-community water system shall either include the text specified in R309-210-6 (7)(a)(i) of this section or shall include the following text in all of the printed materials it distributes through its lead public education program. Water systems may delete information pertaining to lead service lines, upon approval by the Executive Secretary, if no lead service lines exist anywhere in the water system service area. Any additional information presented by a system shall be consistent with the information below and be in plain English that can be understood by lay people.

#### (A) INTRODUCTION

The United States Environmental Protection Agency (EPA) and (insert name of water supplier) are concerned about lead in your drinking water. Some drinking water samples taken from this facility have lead levels above the EPA action level of 15 parts per billion (ppb), or 0.015 milligrams of lead per liter of water (mg/L). Under Federal law we are required to have a program in place to minimize lead in your drinking water by (insert date when corrosion control will be completed for your system). This program includes corrosion control treatment, source water treatment, and public education. We are also required to replace each lead service line that we control if the line contributes lead concentrations of more than 15 ppb after we have completed the comprehensive treatment program. If you have any questions about how we are carrying out the requirements of the lead regulation please give us a call at (insert water system's phone number). This brochure explains the simple steps you can take to protect yourself by reducing your exposure to lead in drinking water.

#### (B) HEALTH EFFECTS OF LEAD

Lead is found throughout the environment in lead-based paint, air, soil, household dust, food, certain types of pottery porcelain and pewter, and water. Lead can pose a significant risk to your health if too much of it enters your body. Lead builds up in the body over many years and can cause damage to the brain, red blood cells and

kidneys. The greatest risk is to young children and pregnant women. Amounts of lead that won't hurt adults can slow down normal mental and physical development of growing bodies. In addition, a child at play often comes into contact with sources of lead contamination -- like dirt and dust -- that rarely affect an adult. It is important to wash children's hands and toys often, and to try to make sure they only put food in their mouths.

#### (C) LEAD IN DRINKING WATER

(I) Lead in drinking water, although rarely the sole cause of lead poisoning, can significantly increase a person's total lead exposure, particularly the exposure of infants who drink baby formulas and concentrated juices that are mixed with water. The EPA estimates that drinking water can make up 20 percent or more of a person's total exposure to lead.

(II) Lead is unusual among drinking water contaminants in that it seldom occurs naturally in water supplies like rivers and lakes. Lead enters drinking water primarily as a result of the corrosion, or wearing away, of materials containing lead in the water distribution system and household plumbing. These materials include lead-based solder used to join copper pipe, brass and chrome plated brass faucets, and in some cases, pipes made of lead that connect houses and buildings to the water mains (service lines). In 1986, Congress banned the use of lead solder containing greater than 0.2% lead, and restricted the lead content of faucets, pipes and other plumbing materials to 8.0%.

(III) When water stands in lead pipes or plumbing systems containing lead for several hours or more, the lead may dissolve into your drinking water. This means the first water drawn from the tap in the morning, or later in the afternoon if the water has not been used all day, can contain fairly high levels of lead.

#### (D) STEPS YOU CAN TAKE IN THE HOME TO REDUCE EXPOSURE TO LEAD IN DRINKING WATER

(I) Let the water run from the tap before using it for drinking or cooking any time the water in a faucet has gone unused for more than six hours. The longer water resides in plumbing the more lead it may contain. Flushing the tap means running the cold water faucet until the water gets



noticeably colder, usually about 15-30 seconds. Although toilet flushing or showering flushes water through a portion of your home's plumbing system, you still need to flush the water in each faucet before using it for drinking or cooking. Flushing tap water is a simple and inexpensive measure you can take to protect your health. It usually uses less than one gallon of water.

(II) Do not cook with, or drink water from the hot water tap. Hot water can dissolve more lead more quickly than cold water. If you need hot water, draw water from the cold tap and heat it.

(III) The steps described above will reduce the lead concentrations in your drinking water. However, if you are still concerned, you may wish to use bottled water for drinking and cooking.

(IV) You can consult a variety of sources for additional information. Your family doctor or pediatrician can perform a blood test for lead and provide you with information about the health effects of lead. State and local government agencies that can be contacted include:

(aa) (insert the name or title of facility official if appropriate) at (insert phone number) can provide you with information about your facility's water supply, and

(bb) The Utah Division of Drinking Water at 536-4200 or the (insert the name of the city or county health department) at (insert phone number) can provide you with information about the health effects of lead.

(b) Content of broadcast materials. A water system shall include the following information in all public service announcements submitted under its lead public education program to television and radio stations for broadcasting:

(i) Why should everyone want to know the facts about lead and drinking water? Because unhealthy amounts of lead can enter drinking water through the plumbing in your home. That's why I urge you to do what I did. I had my water tested for (insert free or \$ per sample). You can contact the (insert the name of the city or water system) for information on testing and on simple ways to reduce your exposure to lead in drinking water.

(ii) To have your water tested for lead, or to get more information about this public health concern, please call (insert the phone number of the city or water system).

(c) Delivery of a public education program

(i) In communities where a significant proportion of the population speaks a language other than English, public education materials shall be communicated in the appropriate language(s).

(ii) A community water system that exceeds the lead action level on the basis of tap water samples collected in accordance with R309-210-6(3) and that is not already repeating public education tasks pursuant to paragraph (c)(iii), (c)(vii), or (c)(viii), of this section, shall, within 60 days:

(A) insert notices in each customer's water utility bill containing the information in R309-210-6(7)(a), along with the following alert on the water bill itself in large print: "SOME HOMES IN THIS COMMUNITY HAVE ELEVATED LEAD LEVELS IN THEIR DRINKING WATER. LEAD CAN POSE A SIGNIFICANT RISK TO YOUR HEALTH. PLEASE READ THE ENCLOSED NOTICE FOR FURTHER INFORMATION." A community water system having a billing cycle that does not include a billing within 60 days of exceeding the action level, or that cannot insert information in the water utility bill without making major changes to its billing system, may use a separate mailing to deliver the information in paragraph (a)(i) of this section as long as the information is delivered to each customer within 60 days of exceeding the action level. Such water systems shall also include the "alert" language specified in this paragraph.

(B) submit the information in R309-210-6(7)(a)(i) to the editorial departments of the major daily and weekly newspapers circulated throughout the community.

(C) deliver pamphlets and/or brochures that contain the public education materials in R309-210-6(7)(a)(i)(B) and (a)(i)(D) to facilities and organizations, including the following:

(I) public schools and/or local school boards;

(II) city or county health department;

(III) Women, Infants, and Children and/or Head Start Program(s) whenever available;

(IV) public and private hospitals and/or clinics;

(V) pediatricians;

(VI) family planning clinics; and

(VII) local welfare agencies.

(D) submit the public service announcement in R309-104-4.2.7.b. to at least five of the radio and television stations with the largest audiences that broadcast to the community served by the water system.

(iii) A community water system shall repeat the tasks contained in Subsections R309-210-6(7)(c)(ii)(A), (B) and (C) every 12 months, and the tasks contained in Subsection R309-210-6(7)(c)(ii)(D) every 6 months for as long as the system exceeds the lead action level.

(iv) Within 60 days after it exceeds the lead action level (unless it already is repeating public education tasks pursuant to paragraph (c)(v) of this section), a non-transient non-community water system shall deliver the public education materials contained in R309-210-6(7)(a)(i) or R309-210-6(7)(a)(ii) as follows:

(A) post informational posters on lead in drinking water in a public place or common area in each of the buildings served by the system; and

(B) distribute informational pamphlets and/or brochures on lead in drinking water to each person served by the non-transient non-community water system. The Executive Secretary may allow the system to utilize electronic transmission in lieu of or combined with printed materials as long as it achieves at least the same coverage.

(v) A non-transient non-community water system shall repeat the tasks contained in R309-210-6(7)(c)(iv) at least once during each calendar year in which the system exceeds the lead action level.

(vi) A water system may discontinue delivery of public education materials if the system has met the lead action level during the most recent six-month monitoring period conducted pursuant to R309-210-6(3). Such a system shall recommence public education in accordance with this

section if it subsequently exceeds the lead action level during any monitoring period.

(vii) A community water system may apply to the Executive Secretary, in writing, (unless the Executive Secretary has waived the requirement for prior Executive Secretary approval) to use the text specified in paragraph (a)(ii) of this section in lieu of the text in paragraph (a)(i) of this section and to perform the tasks listed in paragraphs (c)(iv) and (c)(v) of this section in lieu of the tasks in paragraphs (c)(ii) and (c)(iii) of this section if:

(A) The system is a facility, such as a prison or a hospital, where the population served is not capable of or is prevented from making improvements to plumbing or installing point of use treatment devices; and

(B) The system provides water as part of the cost of services provided and does not separately charge for water consumption.

(viii) (A) A community water system serving 3,300 or fewer people may omit the task contained in paragraph (c)(ii)(D) of this section. As long as it distributes notices containing the information contained in paragraph (a)(i) of this section to every household served by the system, such systems may further limit their public education programs as follows:

(aa) Systems serving 500 or fewer people may forego the task contained in paragraph (c)(ii)(B) of this section. Such a system may limit the distribution of the public education materials required under paragraph (c)(ii)(C) of this section to facilities and organizations served by the system that are most likely to be visited regularly by pregnant women and children, unless it is notified by the Executive Secretary in writing that it must make a broader distribution.

(bb) If approved by the Executive Secretary in writing, a system serving 501 to 3,300 people may omit the task in paragraph (c)(ii)(B) of this section or limit the distribution of the public education materials required under paragraph (c)(ii)(C) of this section to facilities and organizations served by the system that are most likely to be visited regularly by pregnant women and children.

(B) A community water system serving 3,300 or fewer people that delivers public education in accordance with paragraph (c)(viii)(A) of this section shall repeat the required public education tasks at

least once during each calendar year in which the system exceeds the lead action level.

(d) Supplemental monitoring and notification of results.

A water system that fails to meet the lead action level on the basis of tap samples collected in accordance with R309-210-6(3) shall offer to sample the tap water of any customer who requests it. The system is not required to pay for collecting or analyzing the sample, nor is the system required to collect and analyze the sample itself.

## **(8) Reporting requirements.**

All water systems shall report all of the following information to the Executive Secretary in accordance with this section.

(a) Reporting requirements for tap water monitoring for lead and copper and for water quality parameter monitoring

(i) Except as provided in paragraph (a)(i)(H) of this section, a water system shall report the information specified below for all tap water samples specified in R309-210-6(3) and for all water quality parameter samples specified in R309-210-6(5) within the first 10 days following the end of each applicable monitoring period specified in R309-210-6 (3) and (5) (i.e., every six months, annually, every 3 years, or every 9 years).

(A) the results of all tap samples for lead and copper including the location of each site and the criteria under R309-210-6(3)(a)(iii), (iv), (v), (vi), and (vii) under which the site was selected for the system's sampling pool;

(B) Documentation for each tap water lead or copper sample for which the water system request invalidation pursuant to R309-210-6(3)(f)(ii);

(D) the 90th percentile lead and copper concentrations measured from among all lead and copper tap water samples collected during each monitoring period, (calculated in accordance with R309-200-5(2)(c))unless the Executive Secretary calculates the system's 90th percentile lead and copper levels under paragraph (h) of this section;

(E) with the exception of initial tap sampling conducted pursuant to R309-210-6(3)(d)(i), the system shall designate any site which

was not sampled during previous monitoring periods, and include an explanation of why sampling sites have changed;

(F) the results of all tap samples for pH, and where applicable, alkalinity, calcium, conductivity, temperature, and orthophosphate or silica collected under R309-210-6(5)(b) through (e);

(G) the results of all samples collected at the entry point(s) to the distribution system for applicable water quality parameters under R309-210-6(5)(b) through (e).

(H) A water system shall report the results of all water quality parameter samples collected under R309-210-6(5)(c) through (f) during each six month monitoring period specified in R309-210-6(5)(d) within the first 10 days following the end of the monitoring period unless the Executive Secretary has specified a more frequent reporting requirement.

(ii) For a non-transient non-community water system, or a community water system meeting the criteria of R309-210-6(8)(c)(vii)(A) or (B), that does not have enough taps that can provide first draw samples, the system must identify, in writing, each site that did not meet the six hour minimum standing time and the length of standing time for that particular substitute sample collected pursuant to R309-210-6(3)(b)(v) and include this information with the lead and copper tap sample results required to be submitted pursuant to paragraph (a)(i)(A) of this section. The Executive Secretary has waived prior Executive Secretary approval of non-first-draw samples sites selected by the system pursuant to R309-210-6(3)(b)(v).

(iii) No later than 60 days after the addition of a new source or any change in water treatment, unless the Executive Secretary required earlier notification, a water system deemed to have optimized corrosion control under R309-210-6(3)(b)(iii), a water system subject to reduced monitoring pursuant to R309-210-6(3)(d)(iv), or a water system subject to a monitoring waiver pursuant to R309-210-6(3)(g), shall send written documentation to the Executive Secretary describing the change. In those instances where prior Executive Secretary approval of the treatment change or new source is not required, water systems are encouraged to provide the notification to the Executive Secretary beforehand to minimize the risk the treatment change or new source will adversely affect optimal corrosion control.

(iv) Any small system applying for a monitoring waiver under R309-210-6(3)(g), or subject to a waiver granted pursuant to R309-210-6(3)(g)(iii), shall provide the following information to the Executive Secretary in writing by the specified deadline:

(A) By the start of the first applicable monitoring period in R309-210-6(3), any small system applying for a monitoring waiver shall provide the documentation required to demonstrate that it meets the waiver criteria of R309-210-6(3)(g)(i) and (ii).

(B) No later than nine years after the monitoring previously conducted pursuant to R309-210-6(3)(g)(ii) or (g)(iv)(A), each small system desiring to maintain its monitoring waiver shall provide the information required by R309-210-6(3)(g)(iv)(A) and (B).

(C) No later than 60 days after it becomes aware that it is no longer free of lead-containing or copper containing material, as appropriate, each small system with a monitoring waiver shall provide written notification to the Executive Secretary, setting forth the circumstances resulting in the lead containing or copper containing materials being introduced into the system and what corrective action, if any, the system plans to remove these materials

(D) By October 10, 2000, any small system with a waiver granted prior to April 11, 2000 and that has not previously met the requirements of R309-210-6(3)(g)(ii) shall provide the information required by that paragraph.

(v) Each ground water system that limits water quality parameter monitoring to a subset of entry points under R309-210-6(5)(c)(iii) shall provide, by the commencement of such monitoring, written correspondence to the Executive Secretary that identifies the selected entry points and includes information sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the system.

(b) Source water monitoring reporting requirements

(i) A water system shall report the sampling results for all source water samples collected in accordance with R309-210-6(6) within the first 10 days following the end of each source water monitoring period (i.e., annually, per compliance period, per compliance cycle) specified in R309-210-6(6).

(ii) With the exception of the first round of source water sampling conducted pursuant to R309-210-6(6)(b), the system shall specify any site which was not sampled during previous monitoring periods, and include an explanation of why the sampling point has changed.

(c) Corrosion control treatment reporting requirements

By the applicable dates under R309-210-6(2), systems shall report the following information:

(i) for systems demonstrating that they have already optimized corrosion control, information required in R309-210-6(2)(b)(ii) or R309-210-6(2)(b)(iii).

(ii) for systems required to optimize corrosion control, their recommendation regarding optimal corrosion control treatment under R309-210-6(4)(a)(i).

(iii) for systems required to evaluate the effectiveness of corrosion control treatments under R309-210-6(4)(a)(iii), the information required by that paragraph.

(iv) for systems required to install optimal corrosion control designated by the Executive Secretary under R309-210-6(4)(a)(iv), a letter certifying that the system has completed installing that treatment.

(d) Source water treatment reporting requirements

By the applicable dates in R309-210-6(4)(b), systems shall provide the following information to the Executive Secretary :

(i) if required under R309-210-6(4)(b)(ii)(A), their recommendation regarding source water treatment;

(ii) for systems required to install source water treatment under R309-210-6(4)(b)(ii)(B), a letter certifying that the system has completed installing the treatment designated by the Executive Secretary within 24 months after the Executive Secretary designated the treatment.

(e) Lead service line replacement reporting requirements

Systems shall report the following information to the Executive Secretary to demonstrate compliance with the requirements of R309-210-6(4)(c):

(i) Within 12 months after a system exceeds the lead action level in sampling referred to in R309-210-6(4)(c)(i), the system shall demonstrate in writing to the Executive Secretary that it has conducted a materials evaluation, including the evaluation in R309-210-6(3)(a), to identify the initial number of lead service lines in its distribution system, and shall provide the Executive Secretary with the system's schedule for replacing



annually at least 7 percent of the initial number of lead service lines in its distribution system.

(ii) Within 12 months after a system exceeds the lead action level in sampling referred to in R309-210-6(4)(c)(i), and every 12 months thereafter, the system shall demonstrate to the Executive Secretary in writing that the system has either:

(A) replaced in the previous 12 months at least 7 percent of the initial lead service lines (or a greater number of lines specified by the Executive Secretary under R309-210-6(4)(c)(v)) in its distribution system, or

(B) conducted sampling which demonstrates that the lead concentration in all service line samples from an individual line(s), taken pursuant to R309-210-6(3)(b)(iii), is less than or equal to 0.015 mg/L. In such cases, the total number of lines replaced or which meet the criteria in R309-210-6(4)(c)(iii) shall equal at least 7 percent of the initial number of lead lines identified under R309-210-6(8)(a) (or the percentage specified by the Executive Secretary under R309-210-6(4)(c)(v)).

(iii) The annual letter submitted to the Executive Secretary under R309-210-6(8)(e)(ii) shall contain the following information:

(A) the number of lead service lines scheduled to be replaced during the previous year of the system's replacement schedule;

(B) the number and location of each lead service line replaced during the previous year of the system's replacement schedule;

(C) if measured, the water lead concentration and location of each lead service line sampled, the sampling method, and the date of sampling.

(iv) Systems shall also report any additional information as specified by the Executive Secretary, and in a time and manner prescribed by the Executive Secretary, to verify that all partial lead service line replacement activities have taken place.

(f) Public education program reporting requirements

(i) Any water system that is subject to the public education requirements in R309-210-6(7) shall, within ten days after the end of each period in which the system is required to perform public education tasks in

accordance with R309-210-6(7)(c), send written documentation to the Executive Secretary that contains:

(A) A demonstration that the system has delivered the public education materials that meet the content requirements in R309-210-6(7)(a) and (b) and the delivery requirements in R309-210-6(7)(c); and

(B) A list of all the newspapers, radio stations, television stations, and facilities and organizations to which the system delivered public education materials during the period in which the system was required to perform public education tasks.

(ii) Unless required by the Executive Secretary, a system that previously has submitted the information required by paragraph (f)(i)(B) of this section, as long as there have been no changes in the distribution list and the system certifies that the public education materials were distributed to the same list submitted previously.

(g) Reporting of additional monitoring data

Any system which collects sampling data in addition to that required by this subpart shall report the results to the Executive Secretary within the first ten day following the end of the applicable monitoring period under R309-210-6(3), R309-210-6(5) and R309-210-6(6) during which the samples are collected.

(h) Reporting of 90th percentile lead and copper concentrations where the Executive Secretary calculates a system's 90th percentile concentrations. A water system is not required to report the 90th percentile lead and copper concentrations measured from among all lead and copper tap water samples during each monitoring period, as required by paragraph (a)(i)(D) of this section if:

(i) The Executive Secretary has previously notified the water system that it will calculate the water system's 90th percentile lead and copper concentrations, based on the lead and copper tap results submitted pursuant to paragraph (h)(ii)(A) of this section, and has specified a date before the end of the applicable monitoring period by which the system must provide the results of lead and copper tap water samples;

(ii) The system has provided the following information to the Executive Secretary by the date specified in paragraph (h)(i) of this section:

(A) The results of all tap samples for lead and copper including the location of each site and the criteria under R309-210-6(3)(a)(iii), (iv), (v), (vi), and/or (vii) under which the site was

selected for the system's sampling pool, pursuant to paragraph (a)(i)(A) of this section; and

(B) An identification of sampling sites utilized during the current monitoring period that were not sampled during previous monitoring periods, and an explanation why sampling sites have changed; and

(iii) The Executive Secretary has provided the results of the 90th percentile lead and copper calculations, in writing, to the water system before the end of the monitoring period.

### ***R309-210-7. Asbestos Distribution System Monitoring.***

(1) The frequency of monitoring conducted to determine compliance with the maximum contaminant level for asbestos specified in R309-200-5(1) shall be conducted as follows:

(a) Each community and non-transient non-community water system is required to monitor for asbestos during the first three-year compliance period of each nine-year compliance cycle beginning in the compliance period starting January 1, 1993.

(b) If the system believes it is not vulnerable due to corrosion of asbestos-cement pipe, it may apply to the Executive Secretary for a waiver of the monitoring requirement in paragraph (a) of this section. If the Executive Secretary grants the waiver, the system is not required to monitor for asbestos.

(c) The Executive Secretary may grant a waiver based on a consideration of the use of asbestos-cement pipe for finished water distribution and the corrosive nature of the water.

(d) A waiver remains in effect until the completion of the three-year compliance period. Systems not receiving a waiver must monitor in accordance with the provisions of paragraph (a) of this section.

(2) A system vulnerable to asbestos contamination due solely to corrosion of asbestos-cement pipe shall take one sample at a tap served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.

(3) A system vulnerable to asbestos contamination due both to its source water supply (as specified in R309-205-5(2)) and corrosion of asbestos-cement pipe shall take one sample at a tap served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.

(4) A system which exceeds the maximum contaminant levels as determined in R309-205-5(1)(g) shall monitor quarterly beginning in the next quarter after the violation occurred.

(5). The Executive Secretary may decrease the quarterly monitoring requirement to the frequency specified in paragraph (a) of this section provided the Executive Secretary has determined that the system is reliably and consistently below the maximum contaminant level. In no case can the Executive Secretary make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface (or combined surface/ground) water system takes a minimum of four quarterly samples.

(6) If monitoring data collected after January 1, 1990 are generally consistent with the requirements of R309-210-7, then the Executive Secretary may allow systems to use that data to satisfy the monitoring requirement for the initial compliance period beginning January 1, 1993.

### ***R309-210-8. Disinfection Byproducts - Stage 1 Requirements.***

#### **(1) General requirements.**

The requirements in this sub-section establish criteria under which community and non-transient non-community water systems that add a chemical disinfectant to the water in any part of the drinking water treatment process, shall modify their practices to meet MCLs and MRDLs in R309-200-5(3)(c) and meet treatment technique requirements in R309-215-12 and 13. The requirements of this sub-section also establish criteria under which transient non-community water systems that use chlorine dioxide shall modify their practices to meet MRDLs for chlorine dioxide in R309-200-5(3)(c).

##### **(a) Compliance dates.**

(i) Community and Non-transient non-community water systems. Surface water systems serving 10,000 or more persons must comply with this section beginning January 1, 2002. Surface water systems serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water must comply with this section beginning January 1, 2004.

(ii) Transient non-community water systems. Surface water systems serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant must comply with any requirements for chlorine dioxide in this section beginning January 1, 2002. Surface water systems serving fewer than 10,000 persons and using chlorine dioxide as a disinfectant or oxidant and systems using only ground water not under the direct influence of surface water and using chlorine dioxide as a

disinfectant or oxidant must comply with any requirements for chlorine dioxide in this section beginning January 1, 2004.

- (b) Systems must take all samples during normal operating conditions.
- (c) Systems may consider multiple wells drawing water from a single aquifer as one treatment plant for determining the minimum number of TTHM and HAA5 samples required, with approval from the Executive Secretary.
- (d) Failure to monitor in accordance with the monitoring plan required under paragraph (5) of this section is a monitoring violation.
- (e) Failure to monitor will be treated as a violation for the entire period covered by the annual average where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MCLs or MRDLs.
- (f) Systems may use only data collected under the provisions of this section or the federal Information Collection Rule, (40 CFR, Part 141, Subpart M) to qualify for reduced monitoring.

## **(2) Monitoring requirements for disinfection byproducts.**

### **(a) TTHMs and HAA5s**

(i) Routine monitoring. Systems must monitor at the frequency indicated in the following:

(A) If a system elects to sample more frequently than the minimum required, at least 25 percent of all samples collected each quarter (including those taken in excess of the required frequency) must be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples must be taken at locations representative of at least average residence time in the distribution system.

(B) Surface water systems serving at least 10,000 persons shall take four water samples per quarter per treatment plant. At least 25 percent of all samples collected each quarter shall be at locations representing maximum residence time. The remaining samples taken at locations representative of at least average residence time in the distribution system and representing the entire distribution system, taking into account number of persons served, different sources of water, and different treatment methods.

(C) Surface water systems serving from 500 to 9,999 persons shall take one water sample per quarter per treatment plant at a locations representing maximum residence time.

(D) Surface water systems serving fewer than 500 persons shall take one sample per year per treatment plant during month of warmest water temperature at a location representing maximum residence time. If the sample (or average of annual samples, if more than one sample is taken) exceeds the MCL, the system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until the system meets reduced monitoring criteria in paragraph (2)(a)(v) of this section.

(E) Systems using only ground water not under direct influence of surface water using chemical disinfectant and serving at least 10,000 persons shall take one water sample per quarter per treatment plant at a locations representing maximum residence time.

(F) Systems using only ground water not under direct influence of surface water using chemical disinfectant and serving fewer than 10,000 persons shall take one sample per year per treatment plant during month of warmest water temperature at a location representing maximum residence time. If the sample (or average of annual samples, if more than one sample is taken) exceeds the MCL, the system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until the system meets criteria in paragraph (2)(a)(v) of this section for reduced monitoring.

(ii) Systems may reduce monitoring, except as otherwise provided, if the system has monitored for at least one year and is in accordance with the following paragraphs. Any Surface water system serving fewer than 500 persons may not reduce its monitoring to less than one sample per treatment plant per year.

(A) A surface water system serving at least 10,000 persons which has a source water annual average TOC level, before any treatment, of less than or equal to 4.0 mg/L and has a TTHM annual average of less than or equal to 0.040 mg/L and has a HAA5 annual average of less than or equal to 0.030 mg/L may reduce monitoring to one sample per treatment plant per quarter at a distribution system location reflecting maximum residence time.

(B) A surface water system serving from 500 to 9,999 persons which has a source water annual average TOC level, before any treatment, of less than or equal to 4.0 mg/L and has a TTHM annual average of less than or equal to 0.040 mg/L and has a HAA5 annual average of less than or equal to 0.030 mg/L may reduce monitoring to one sample per treatment plant per year at a distribution system location reflecting maximum residence time during the month of warmest water temperature.

(C) A system using only ground water not under direct influence of surface water using chemical disinfectant and serving at least 10,000 persons that has a TTHM annual average of less than or equal to 0.040 mg/L and has a HAA5 annual average of less than or equal to 0.030 mg/L may reduce monitoring to one sample per treatment plant per year at a distribution system location reflecting maximum residence time during the month of warmest water temperature.

(D) A system using only ground water not under direct influence of surface water using chemical disinfectant and serving fewer than 10,000 persons that has a TTHM annual average of less than or equal to 0.040 mg/L and has a HAA5 annual average of less than or equal to 0.030 mg/L for two consecutive years or has a TTHM annual average of less than or equal to 0.020 mg/L and has a HAA5 annual average of less than or equal to 0.015mg/L for one year may reduce monitoring to one sample per treatment plant per three year monitoring cycle at a distribution system location reflecting maximum residence time during the month of warmest water temperature, with the three-year cycle beginning on January 1 following the quarter in which the system qualifies for reduced monitoring.

(iii) Monitoring requirements for source water TOC in order to qualify for reduced monitoring for TTHM and HAA5 under paragraph (2)(a)(ii) of this section, surface water systems not monitoring under the provisions of paragraph (d) of this section must take monthly TOC samples every 30 days at a location prior to any treatment, beginning April 1, 2008 or earlier, if specified by the Executive Secretary. In addition to meeting other criteria for reduced monitoring in paragraph (2)(a)(ii) of this section, the source water TOC running annual average must be equal to or less than 4.0 mg/L (based on the most recent four quarters of monitoring) on a continuing basis at each treatment plant to reduce or remain on reduced monitoring for TTHM and HAA5. Once qualified for reduced monitoring for TTHM and HAA5 under paragraph (2)(a)(ii) of this section, a system may reduce source water TOC monitoring to quarterly TOC samples taken every 90 days at a location prior to any treatment.

(iv) Systems on a reduced monitoring schedule may remain on that reduced schedule as long as the average of all samples taken in the year (for systems which must monitor quarterly) or the result of the sample (for systems which must monitor no more frequently than annually) is no more than 0.060 mg/L and 0.045 mg/L for TTHMs and HAA5, respectively. Systems that do not meet these levels must resume monitoring at the frequency identified in paragraph (2)(a)(i) of this section in the quarter immediately following the monitoring period in which the system exceeds 0.060 mg/L or 0.045 mg/L for TTHM or HAA5, respectively. For systems using only ground water not under the direct influence of surface water and serving fewer than 10,000 persons, if either the TTHM annual average is greater than 0.080 mg/L or the HAA5 annual average is greater than 0.060 mg/L, the system must go to the increased monitoring identified in paragraph (2)(a)(i) of this section in the quarter immediately following the monitoring period in which the system exceeds 0.080 mg/L or 0.060 mg/L for TTHMs or HAA5 respectively.

(v) Systems on increased monitoring may return to routine monitoring if, after at least one year of monitoring their TTHM annual average is less than or equal to 0.060 mg/L and their HAA5 annual average is less than or equal to 0.045 mg/L.

(vi) The Executive Secretary may return a system to routine monitoring when appropriate to protect public health.

(b) Chlorite. Community and non-transient non-community water systems using chlorine dioxide, for disinfection or oxidation, must conduct monitoring for chlorite.

(i) Routine monitoring.

(A) Daily monitoring. Systems must take daily samples at the entrance to the distribution system. For any daily sample that exceeds the chlorite MCL, the system must take additional samples in the distribution system the following day at the locations required by paragraph (2)(b)(ii) of this section, in addition to the sample required at the entrance to the distribution system.

(B) Monthly monitoring. Systems must take a three-sample set each month in the distribution system. The system must take one sample at each of the following locations: near the first customer, at a location representative of average residence time, and at a location reflecting maximum residence time in the distribution system. Any additional routine sampling must be conducted in the same manner (as three-sample sets, at the specified locations). The



system may use the results of additional monitoring conducted under paragraph (2)(b)(ii) of this section to meet the requirement for monitoring in this paragraph.

(ii) Additional monitoring. On each day following a routine sample monitoring result that exceeds the chlorite MCL at the entrance to the distribution system, the system is required to take three chlorite distribution system samples at the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).

(iii) Reduced monitoring.

(A) Chlorite monitoring at the entrance to the distribution system required by paragraph (2)(b)(i)(A) of this section may not be reduced.

(B) Chlorite monitoring in the distribution system required by paragraph (2)(b)(i)(B) of this section may be reduced to one three-sample set per quarter after one year of monitoring where no individual chlorite sample taken in the distribution system under paragraph (2)(b)(i)(B) of this section has exceeded the chlorite MCL and the system has not been required to conduct monitoring under paragraph (2)(b)(ii) of this section. The system may remain on the reduced monitoring schedule until either any of the three individual chlorite samples taken monthly in the distribution system under paragraph (2)(b)(i)(B) of this section exceeds the chlorite MCL or the system is required to conduct monitoring under paragraph (2)(b)(ii) of this section, at which time the system must revert to routine monitoring.

(c) Bromate.

(i) Routine monitoring. Community and nontransient noncommunity systems using ozone, for disinfection or oxidation, must take one sample per month for each treatment plant in the system using ozone. Systems must take samples monthly at the entrance to the distribution system while the ozonation system is operating under normal conditions.

(ii) Reduced monitoring.

(A) Until March 31, 2009, systems required to analyze for bromate may reduce monitoring from monthly to once per quarter, if the system demonstrates that the average source water bromide concentration is less than 0.05 mg/L based upon representative

monthly bromide measurements for one year. The system may remain on reduced bromate monitoring until the running annual average source water bromide concentration, computed quarterly, is equal to or greater than 0.05 mg/L based upon representative monthly measurements. If the running annual average source water bromide concentration is greater than or equal to 0.05 mg/L, the system must resume routine monitoring required by paragraph (2)(c)(i) of this section in the following month.

(B) Beginning April 1, 2009, systems may no longer use the provisions of paragraph (2)(c)(ii)(A) of this section to qualify for reduced monitoring. A system required to analyze for bromate may reduce monitoring from monthly to quarterly, if the system's running annual average bromate concentration is equal to or less than 0.0025 mg/L based on monthly bromate measurements under paragraph (2)(c)(i) of this section for the most recent four quarters, with samples analyzed using Method 317.0 Revision 2.0, 326.0 or 321.8. If a system has qualified for reduced bromate monitoring under paragraph (2)(c)(ii)(A) of this section, that system may remain on reduced monitoring as long as the running annual average of quarterly bromate samples is less than or equal to 0.0025 mg/L based on samples analyzed using Method 317.0 Revision 2.0, 326.0 or 321.8. If the running annual average bromate concentration is greater than 0.0025 mg/L, the system must resume routine monitoring required by (2)(c)(i) of this section.

### **(3) Monitoring requirements for disinfectant residuals.**

#### **(a) Chlorine and chloramines.**

(i) Routine monitoring. Community and nontransient noncommunity water systems that use chlorine or chloramines must measure the residual disinfectant level in distribution system at the same point in the distribution system and at the same time as total coliforms are sampled, as specified in R309-210-5. The Executive Secretary may allow a public water system which uses both disinfected and undisinfected sources to take disinfectant residual samples at points other than the total coliform sampling points if the Executive Secretary determines that such sampling points are more representative of treated (disinfected) water quality within the distribution system. Water systems shall take a minimum of three residual disinfectant level samples each week.

(ii) In addition, ground water systems shall take the following readings at each facility a minimum of three times a week: the total volume of water

treated; the type and amount of disinfectant used in treating the water (clearly indicating the weight if gas feeders are used, or the percent solution and volume fed if liquid feeders are used); and the setting of the rotometer valve or injector pump. Surface water systems may use the results of residual disinfectant concentration sampling conducted under R309-215-10(3) for systems which filter, in lieu of taking separate samples.

(iii) Reduced monitoring. Monitoring may not be reduced.

(b) Chlorine Dioxide.

(i) Routine monitoring. Community, nontransient noncommunity, and transient noncommunity water systems that use chlorine dioxide for disinfection or oxidation must take daily samples at the entrance to the distribution system. For any daily sample that exceeds the MRDL, the system must take samples in the distribution system the following day at the locations required by paragraph (3)(b)(ii) of this section, in addition to the sample required at the entrance to the distribution system.

(ii) Additional monitoring. On each day following a routine sample monitoring result that exceeds the MRDL, the system is required to take three chlorine dioxide distribution system samples. If chlorine dioxide or chloramines are used to maintain a disinfectant residual in the distribution system, or if chlorine is used to maintain a disinfectant residual in the distribution system and there are no disinfection addition points after the entrance to the distribution system (i.e., no booster chlorination), the system must take three samples as close to the first customer as possible, at intervals of at least six hours. If chlorine is used to maintain a disinfectant residual in the distribution system and there are one or more disinfection addition points after the entrance to the distribution system (i.e., booster chlorination), the system must take one sample at each of the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).

(iii) Reduced monitoring. Chlorine dioxide monitoring may not be reduced.

**(4) Bromide.**

Systems required to analyze for bromate may reduce bromate monitoring from monthly to once per quarter, if the system demonstrates that the average source water bromide concentration is less than 0.05 mg/L based upon representative monthly measurements

for one year. The system must continue bromide monitoring to remain on reduced bromate monitoring.

## **(5) Monitoring plans.**

Each system required to monitor under this section must develop and implement a monitoring plan. The system must maintain the plan and make it available for inspection by the Executive Secretary and the general public no later than 30 days following the applicable compliance dates in R309-210-8(1)(a). All Surface water systems serving more than 3300 people must submit a copy of the monitoring plan to the Executive Secretary no later than the date of the first report required under R309-105-16(2). The Executive Secretary may also require the plan to be submitted by any other system. After review, the Executive Secretary may require changes in any plan elements. The plan must include at least the following elements.

- (a) Specific locations and schedules for collecting samples for any parameters included in this subpart.
- (b) How the system will calculate compliance with MCLs, MRDLs, and treatment techniques.
- (c) If approved for monitoring as a consecutive system, or if providing water to a consecutive system, the Executive Secretary may modify the monitoring requirements treating the systems as a single distribution system, however, the sampling plan shall reflect the entire distribution system of all interconnected systems.

## **(6) Compliance requirements.**

- (a) General requirements.
  - (i) Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system fails to monitor for TTHM, HAA5, or bromate, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average. Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MRDLs for chlorine and chloramines, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average.
  - (ii) All samples taken and analyzed under the provisions of this section shall be included in determining compliance, even if that number is greater than the minimum required.

(iii) If, during the first year of monitoring under R309-210-8, any individual quarter's average will cause the running annual average of that system to exceed the MCL, the system is out of compliance at the end of that quarter.

(b) Disinfection byproducts.

(i) TTHMs and HAA5.

(A) For systems monitoring quarterly, compliance with MCLs in R309-200-5(3)(c) shall be based on a running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected by the system as prescribed by R309-210-8(2)(a).

(B) For systems monitoring less frequently than quarterly, systems demonstrate MCL compliance if the average of samples taken that year under the provisions of R309-210-8(2)(a) does not exceed the MCLs in R309-200-5(3)(c). If the average of these samples exceeds the MCL, the system shall increase monitoring to once per quarter per treatment plant and such a system is not in violation of the MCL until it has completed one year of quarterly monitoring, unless the result of fewer than four quarters of monitoring will cause the running annual average to exceed the MCL, in which case the system is in violation at the end of that quarter. Systems required to increase monitoring frequency to quarterly monitoring shall calculate compliance by including the sample which triggered the increased monitoring plus the following three quarters of monitoring.

(C) If the running annual arithmetic average of quarterly averages covering any consecutive four-quarter period exceeds the MCL, the system is in violation of the MCL and shall notify the public pursuant to R309-220, in addition to reporting to the Executive Secretary pursuant to R309-105-16.

(D) If a PWS fails to complete four consecutive quarters of monitoring, compliance with the MCL for the last four-quarter compliance period shall be based on an average of the available data.

(ii) Chlorite. Compliance shall be based on an arithmetic average of each three sample set taken in the distribution system as prescribed by R309-210-8(2)(b)(i)(B) and (2)(b)(ii). If the arithmetic average of any three sample sets exceeds the MCL, the system is in violation of the MCL and

shall notify the public pursuant to R309-220, in addition to reporting to the Executive Secretary pursuant to R309-105-16.

(iii) Bromate. Compliance shall be based on a running annual arithmetic average, computed quarterly, of monthly samples (or, for months in which the system takes more than one sample, the average of all samples taken during the month) collected by the system as prescribed by R309-210-8(2)(c). If the average of samples covering any consecutive four-quarter period exceeds the MCL, the system is in violation of the MCL and shall notify the public pursuant to R309-220, in addition to reporting to the Executive Secretary pursuant to R309-105-16. If a PWS fails to complete 12 consecutive months' monitoring, compliance with the MCL for the last four-quarter compliance period shall be based on an average of the available data.

(c) Disinfectant residuals.

(i) Chlorine and chloramines.

(A) Compliance shall be based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples collected by the system under R309-210-8(3)(a). If the average covering any consecutive four-quarter period exceeds the MRDL, the system is in violation of the MRDL and shall notify the public pursuant to R309-220, in addition to reporting to the Executive Secretary pursuant to R309-105-16.

(B) In cases where systems switch between the use of chlorine and chloramines for residual disinfection during the year, compliance shall be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance. Reports submitted pursuant to R309-105-16 shall clearly indicate which residual disinfectant was analyzed for each sample.

(ii) Chlorine dioxide.

(A) Acute violations. Compliance shall be based on consecutive daily samples collected by the system under R309-210-8(3)(b). If any daily sample taken at the entrance to the distribution system exceeds the MRDL, and on the following day one (or more) of the three samples taken in the distribution system exceed the MRDL, the system is in violation of the MRDL and shall take immediate corrective action to lower the level of chlorine dioxide below the MRDL and shall notify the public pursuant to the procedures for acute health risks in R309-220-5. Failure to take samples in the distribution system the day following an exceedance of the

chlorine dioxide MRDL at the entrance to the distribution system will also be considered an MRDL violation and the system shall notify the public of the violation in accordance with the provisions for acute violations under R309-220-5 in addition to reporting the Executive Secretary pursuant to R309-105-16.

(B) Nonacute violations. Compliance shall be based on consecutive daily samples collected by the system under R309-210-8(3)(b). If any two consecutive daily samples taken at the entrance to the distribution system exceed the MRDL and all distribution system samples taken are below the MRDL, the system is in violation of the MRDL and shall take corrective action to lower the level of chlorine dioxide below the MRDL at the point of sampling and will notify the public pursuant to the procedures for nonacute health risks in R309-220-6 in addition to reporting to the Executive Secretary pursuant to R309-105-16. Failure to monitor at the entrance to the distribution system the day following an exceedance of the chlorine dioxide MRDL at the entrance to the distribution system is also an MRDL violation and the system shall notify the public of the violation in accordance with the provisions for nonacute violations under R309-220-6 in addition to reporting to the Executive Secretary pursuant to R309-105-16.

### ***R309-210-9. Disinfection Byproducts - Initial Distribution System Evaluations.***

#### **(1) General requirements.**

(a) The requirements of this sub-section establish monitoring and other requirements for identifying R309-210-10 compliance monitoring locations for determining compliance with maximum contaminant levels for total trihalomethanes (TTHM) and haloacetic acids (five)(HAA5). The water system must use an Initial Distribution System Evaluation (IDSE) to determine locations with representative high TTHM and HAA5 concentrations throughout the distribution system. IDSEs are used in conjunction with, but separate from, R309-210-8 compliance monitoring, to identify and select R309-210-10 compliance monitoring locations.

(b) Applicability. Community water systems that uses a primary or residual disinfectant other than ultraviolet light or delivers water that has been treated with a primary or residual disinfectant other than ultraviolet light; or if the system is a non-transient non-community water systems that serves at least 10,000 people and uses a primary or residual disinfectant other than ultraviolet light or delivers water

that has been treated with a primary or residual disinfectant other than ultraviolet light are subject to these requirements.

(c) Schedule. The water system must comply with the requirements of this subpart on the schedule in paragraph (c)(i).

(i) For water systems that are not part of a combined distribution system and systems that serve the largest population in the combined distribution system.

(A) For water systems that serve a population greater than or equal to 100,000:

(I) The water system must submit a standard monitoring plan or system specific study plan or 40/30 certification to the Executive Secretary by or receive very small system waiver from the Executive Secretary by October 1, 2006.

(II) The water system must complete the standard monitoring or system specific study by September 30, 2008.

(III) The water system must submit the IDSE report to the Executive Secretary by January 1, 2009.

(B) For water systems that serve a population from 50,000 to 99,999:

(I) The water system must submit a standard monitoring plan or system specific study plan or 40/30 certification to the Executive Secretary by or receive very small system waiver from the Executive Secretary by April 1, 2007.

(II) The water system must complete the standard monitoring or system specific study by March 31, 2009.

(III) The water system must submit the IDSE report to the Executive Secretary by July 1, 2009.

(C) For water systems that serve a population from 10,000 to 49,999:

(I) The water system must submit a standard monitoring plan or system specific study plan or 40/30 certification to the Executive Secretary by or receive very small system waiver from the Executive Secretary by October 1, 2007.



(II) The water system must complete the standard monitoring or system specific study by September 30, 2009.

(III) The water system must submit the IDSE report to the Executive Secretary by January 1, 2010.

(D) For community water systems that serve a population less than 10,000:

(I) The water system must submit a standard monitoring plan or system specific study plan or 40/30 certification to the Executive Secretary by or receive very small system waiver from the Executive Secretary by April 1, 2008.

(II) The water system must complete the standard monitoring or system specific study by March 31, 2010.

(III) The water system must submit the IDSE report to the Executive Secretary by July 1, 2010.

(ii) For other water systems that are part of a combined distribution system:

(A) For wholesale systems or consecutive systems:

(I) The water system must submit a standard monitoring plan or system specific study plan or 40/30 certification to the Executive Secretary by or receive very small system waiver from the Executive Secretary at the same time as the system with the earliest compliance date in the combined distribution system.

(II) The water system must complete the standard monitoring or system specific study at the same time as the system with the earliest compliance date in the combined distribution system.

(III) The water system must submit the IDSE report to the Executive Secretary by at the same time as the system with the earliest compliance date in the combined distribution system.

(iii) If, within 12 months after the date the water is required to submit the information in (i)(A)(I), (B)(I), (C)(I), (D)(I) and (ii)(A)(I) above, the

Executive Secretary does not approve the water system plan or notify the water system that it has not yet completed its review, the water system may consider the plan that was submitted as approved. The water system must implement that plan and must complete standard monitoring or a system specific study no later than the date identified in (i)(A)(II), (B)(II), (C)(II), (D)(II) and (ii)(A)(II) above.

(iv) The water system must submit the 40/30 certification under R309-210-9(4) by the date identified in (i)(A)(II), (B)(II), (C)(II), (D)(II) and (ii)(A)(II) above.

(v) If, within three months after the date identified in (i)(A)(III), (B)(III), (C)(III), (D)(III) and (ii)(A)(III) above (nine months after the date identified in this column if the water system must comply on the schedule in paragraph (c)(i)(C) of this section), the Executive Secretary does not approve the IDSE report or notify the water system that it has not yet completed its review, the water system may consider the report submitted as approved and must implement the recommended R309-210-10 monitoring as required.

(vi) For the purpose of the schedule in paragraph (c)(i) through (c)(v) of this section, the Executive Secretary may determine that the combined distribution system does not include certain consecutive systems based on factors such as receiving water from a wholesale system only on an emergency basis or receiving only a small percentage and small volume of water from a wholesale system. The Executive Secretary may also determine that the combined distribution system does not include certain wholesale systems based on factors such as delivering water to a consecutive system only on an emergency basis or delivering only a small percentage and small volume of water to a consecutive system.

(d) The water system must conduct standard monitoring that meets the requirements in R309-210-9(2), or a system specific study that meets the requirements in R309-210-9(3), or certify to the Executive Secretary that the water system meet 40/30 certification criteria under R309-210-9(4), or qualify for a very small system waiver under R309-210-9(5).

(i) The water system must have taken the full complement of routine TTHM and HAA5 compliance samples required of a system with the population and source water under R309-210-8 (or the water system must have taken the full complement of reduced TTHM and HAA5 compliance samples required of a system with the population and source water under R309-210-8 if the water system meets reduced monitoring criteria under R309-210-8) during the period specified in R309-210-9(4)(a) to meet the 40/ 30 certification criteria in R309-210-9(4) the water system must have

taken TTHM and HAA5 samples under R309-200-4(3) and R309-210-8 to be eligible for the very small system waiver in R309-210-9(5).

(ii) If the water system has not taken the required samples, the water system must conduct standard monitoring that meets the requirements in R309-210-9(2), or a system specific study that meets the requirements in R309-210-9(3).

(e) The water system must use only the analytical methods specified in R309-200-4(3), or otherwise approved by EPA for monitoring under this subpart, to demonstrate compliance with the requirements of this subpart.

(f) IDSE results will not be used for the purpose of determining compliance with MCLs in R309-200-5(3)(c).

## **(2) Standard monitoring.**

(a) Standard monitoring plan. The standard monitoring plan must comply with paragraphs (a)(i) through (a)(iv) of this section. The water system must prepare and submit the standard monitoring plan to the Executive Secretary according to the schedule in R309-210-9(1)(c).

(i) The standard monitoring plan must include a schematic of the distribution system (including distribution system entry points and their sources, and storage facilities), with notes indicating locations and dates of all projected standard monitoring, and all projected R309-210-8 compliance monitoring.

(ii) The standard monitoring plan must include justification of standard monitoring location selection and a summary of data the water system relied on to justify standard monitoring location selection.

(iii) The standard monitoring plan must specify the population served and system type (surface water or ground water).

(iv) The water system must retain a complete copy of the standard monitoring plan submitted under this paragraph (a), including any Executive Secretary modification of the standard monitoring plan, for as long as the water system is required to retain the IDSE report under R309-105-17(8).

(b) Standard monitoring.

(i) The water system must monitor as indicated in paragraph (b)(i). The water system must collect dual sample sets at each monitoring location.

One sample in the dual sample set must be analyzed for TTHM. The other sample in the dual sample set must be analyzed for HAA5. The water system must conduct one monitoring period during the peak historical month for TTHM levels or HAA5 levels or the month of warmest water temperature. The water system must review available compliance, study, or operational data to determine the peak historical month for TTHM or HAA5 levels or warmest water temperature.

(A) Surface water systems serving less than 500 population which are consecutive systems.

(I) One monitoring period per year, dual sample sets must be taken during the peak historical month. Two dual samples sets must be collected per monitoring period.

(II) One dual sample set must be taken at the high TTHM location in the distribution system.

(III) One dual sample set must be taken near the entry point of the disinfected water into the distribution system.

(B) Surface water systems serving less than 500 population which are non-consecutive systems.

(I) One monitoring period per year, dual sample sets must be taken during the peak historical month. Two dual samples sets must be collected per monitoring period.

(II) One dual sample set must be taken at the high TTHM location in the distribution system.

(III) One dual sample set must be taken at the high HAA5 location in the distribution system.

(C) Surface water systems serving between 500 to 3,300 population which are consecutive systems.

(I) Four monitoring periods per year, dual sample sets must be taken every 90 days. Two dual samples sets must be collected per monitoring period.

(II) One dual sample set must be taken at the high TTHM location in the distribution system.

(III) One dual sample set must be taken near the entry point of the disinfected water into the distribution system.

(D) Surface water systems serving between 500 to 3,300 population which are non-consecutive systems.

(I) Four monitoring periods per year, dual sample sets must be taken every 90 days. Two dual samples sets must be collected per monitoring period.

(II) One dual sample set must be taken at the high TTHM location in the distribution system.

(III) One dual sample set must be taken at the high HAA5 location in the distribution system.

(E) Surface water systems serving between 3,301 to 9,999 population.

(I) Four monitoring periods per year, dual sample sets must be taken every 90 days. Four dual samples sets must be collected per monitoring period.

(II) Two dual sample sets must be taken at the high TTHM locations in the distribution system.

(III) One dual sample set must be taken at the high HAA5 location in the distribution system.

(IV) One dual sample set must be taken at an average residence time of the disinfected water in the distribution system.

(F) Surface water systems serving between 10,000 to 49,999 population.

(I) Six monitoring periods per year, dual sample sets must be taken every 60 days. Eight dual samples sets must be collected per monitoring period.

(II) Three dual sample sets must be taken at the high TTHM locations in the distribution system.

(III) Two dual sample sets must be taken at the high HAA5 locations in the distribution system.

(IV) Two dual sample sets must be taken at an average residence time of the disinfected water in the distribution system.

(V) One dual sample set must be taken near the entry point of the disinfected water into the distribution system.

(G) Surface water systems serving between 50,000 to 249,999 population.

(I) Six monitoring periods per year, dual sample sets must be taken every 60 days. 16 dual samples sets must be collected per monitoring period.

(II) Five dual sample sets must be taken at the high TTHM locations in the distribution system.

(III) Four dual sample sets must be taken at the high HAA5 locations in the distribution system.

(IV) Four dual sample sets must be taken at an average residence time of the disinfected water in the distribution system.

(V) Three dual sample sets must be taken near the entry point of the disinfected water into the distribution system.

(H) Surface water systems serving between 250,000 to 999,999 population.

(I) Six monitoring periods per year, dual sample sets must be taken every 60 days. 24 dual samples sets must be collected per monitoring period.

(II) Eight dual sample sets must be taken at the high TTHM locations in the distribution system.

(III) Six dual sample sets must be taken at the high HAA5 locations in the distribution system.

(IV) Six dual sample sets must be taken at an average residence time of the disinfected water in the distribution system.

(V) Four dual sample sets must be taken near the entry point of the disinfected water into the distribution system.

(I) Surface water systems serving between 1,000,000 to 4,999,999 population.

(I) Six monitoring periods per year, dual sample sets must be taken every 60 days. 32 dual samples sets must be collected per monitoring period.

(II) Ten dual sample sets must be taken at the high TTHM locations in the distribution system.

(III) Eight dual sample sets must be taken at the high HAA5 locations in the distribution system.

(IV) Eight dual sample sets must be taken at an average residence time of the disinfected water in the distribution system.

(V) Six dual sample sets must be taken near the entry point of the disinfected water into the distribution system.

(J) Surface water systems serving 5,000,000 or more population.

(I) Six monitoring periods per year, dual sample sets must be taken every 60 days. 40 dual samples sets must be collected per monitoring period.

(II) Twelve dual sample sets must be taken at the high TTHM locations in the distribution system.

(III) Ten dual sample sets must be taken at the high HAA5 locations in the distribution system.

(IV) Eight dual sample sets must be taken at an average residence time of the disinfected water in the distribution system.

(V) Eight dual sample sets must be taken near the entry point of the disinfected water into the distribution system.

(K) Ground water systems serving less than 500 population which are consecutive systems.

(I) One monitoring period per year, dual sample sets must be taken during the peak historical month. Two dual samples sets must be collected per monitoring period.

(II) One dual sample set must be taken at the high TTHM location in the distribution system.

(III) One dual sample set must be taken near the entry point of the disinfected water into the distribution system.

(L) Ground water systems serving less than 500 population which are non-consecutive systems.

(I) One monitoring period per year, dual sample sets must be taken during the peak historical month. Two dual samples sets must be collected per monitoring period.

(II) One dual sample set must be taken at the high TTHM location in the distribution system.

(III) One dual sample set must be taken at the high HAA5 location in the distribution system.

(M) Ground water systems serving between 500 to 9,999 population.

(I) Four monitoring periods per year, dual sample sets must be taken every 90 days. Two dual samples sets must be collected per monitoring period.

(II) One dual sample set must be taken at the high TTHM location in the distribution system.

(III) One dual sample set must be taken at the high HAA5 location in the distribution system.

(N) Ground water systems serving between 10,000 to 99,999 population.

(I) Four monitoring periods per year, dual sample sets must be taken every 90 days. Six dual samples sets must be collected per monitoring period.

(II) Two dual sample sets must be taken at the high TTHM locations in the distribution system.

(III) Two dual sample sets must be taken at the high HAA5 locations in the distribution system.



(IV) One dual sample set must be taken at an average residence time of the disinfected water in the distribution system.

(V) One dual sample set must be taken near the entry point of the disinfected water into the distribution system.

(O) Ground water systems serving between 100,000 to 499,999 population.

(I) Four monitoring periods per year, dual sample sets must be taken every 90 days. Eight dual samples sets must be collected per monitoring period.

(II) Three dual sample sets must be taken at the high TTHM locations in the distribution system.

(III) Three dual sample sets must be taken at the high HAA5 locations in the distribution system.

(IV) One dual sample set must be taken at an average residence time of the disinfected water in the distribution system.

(V) One dual sample set must be taken near the entry point of the disinfected water into the distribution system.

(P) Ground water systems serving 500,000 or greater population.

(I) Four monitoring periods per year, dual sample sets must be taken every 90 days. Twelve dual samples sets must be collected per monitoring period.

(II) Four dual sample sets must be taken at the high TTHM locations in the distribution system.

(III) Four dual sample sets must be taken at the high HAA5 locations in the distribution system.

(IV) Two dual sample sets must be taken at an average residence time of the disinfected water in the distribution system.

(V) Two dual sample sets must be taken near the entry point of the disinfected water into the distribution system.

(Q) A dual sample set (i.e., a TTHM and an HAA5 sample) must be taken at each monitoring location during each monitoring period.

(R) The peak historical month is the month with the highest TTHM or HAA5 levels or the warmest water temperature.

(ii) The water system must take samples at locations other than the existing R309-210-8 monitoring locations. Monitoring locations must be distributed throughout the distribution system.

(iii) If the number of entry points to the distribution system is fewer than the specified number of entry point monitoring locations, excess entry point samples must be replaced equally at high TTHM and HAA5 locations. If there is an odd extra location number, the water system must take a sample at a high TTHM location. If the number of entry points to the distribution system is more than the specified number of entry point monitoring locations, the water system must take samples at entry points to the distribution system having the highest annual water flows.

(iv) The system monitoring under this paragraph (b) may not be reduced under the provisions of R309-105-5(2).

(c) IDSE report. The IDSE report must include the elements required in paragraphs (c)(i) through (c)(iv) of this section. The water system must submit the IDSE report to the Executive Secretary according to the schedule in R309-210-9(1)(c).

(i) The IDSE report must include all TTHM and HAA5 analytical results from R309-210-8 compliance monitoring and all standard monitoring conducted during the period of the IDSE as individual analytical results and LRAAs presented in a tabular or spreadsheet format acceptable to the Executive Secretary. If changed from the standard monitoring plan submitted under paragraph (a) of this section, the report must also include a schematic of the distribution system, the population served, and system type (surface water or ground water).

(ii) The IDSE report must include an explanation of any deviations from the approved standard monitoring plan.

(iii) The water system must recommend and justify R309-210-10 compliance monitoring locations and timing based on the protocol in R309-210-9(6).

(iv) The water system must retain a complete copy of the IDSE report submitted under this section for 10 years after the date that the water

system submitted the report. If the Executive Secretary modifies the R309-210-10 monitoring requirements that the water system recommended in the IDSE report or if the Executive Secretary approves alternative monitoring locations, the water system must keep a copy of the Executive Secretary's notification on file for 10 years after the date of the Executive Secretary's notification. The water system must make the IDSE report and any Executive Secretary notification available for review by the Executive Secretary or the public.

### **(3) System specific studies.**

(a) System specific study plan. The water system specific study plan must be based on either existing monitoring results as required under paragraph (a)(i) of this section or modeling as required under paragraph (a)(ii) of this section. The water system must prepare and submit the system specific study plan to the Executive Secretary according to the schedule in R309-210-9(1)(c).

(i) Existing monitoring results. The water system may comply by submitting monitoring results collected before the water system is required to begin monitoring under R309-210-9(1)(c). The monitoring results and analysis must meet the criteria in paragraphs (a)(i)(A) and (a)(i)(B) of this section.

(A) Minimum requirements.

(I) TTHM and HAA5 results must be based on samples collected and analyzed in accordance with R309-200-4(3). Samples must be collected no earlier than five years prior to the study plan submission date.

(II) The monitoring locations and frequency must meet the conditions identified in this paragraph (a)(i)(A)(II). Each location must be sampled once during the peak historical month for TTHM levels or HAA5 levels or the month of warmest water temperature for every 12 months of data submitted for that location. Monitoring results must include all R309-210-8 compliance monitoring results plus additional monitoring results as necessary to meet minimum sample requirements.

(III) Surface water systems serving a population less than 500 shall have data from:

(aa) three monitoring locations; and

(bb) three samples for each TTHM and HAA5.

(IV) Surface water systems serving a population between 500 to 3,300 shall have data from:

(aa) three monitoring locations; and

(bb) nine samples each for TTHM and HAA5.

(V) Surface water systems serving a population between 3,301 to 9,999 shall have data from:

(aa) six monitoring locations; and

(bb) 36 samples each for TTHM and HAA5.

(VI) Surface water systems serving a population between 10,000 to 49,999 shall have data from:

(aa) 12 monitoring locations; and

(bb) 72 samples each for TTHM and HAA5.

(VII) Surface water systems serving a population between 50,000 to 249,999 shall have data from:

(aa) 24 monitoring locations; and

(bb) 144 samples each for TTHM and HAA5.

(VIII) Surface water systems serving a population between 250,000 to 999,999 shall have data from:

(aa) 36 monitoring locations; and

(bb) 216 samples each for TTHM and HAA5.

(IX) Surface water systems serving a population between 1,000,000 to 4,999,999 shall have data from:

(aa) 48 monitoring locations; and

(bb) 288 samples each for TTHM and HAA5.

(X) Surface water systems serving a population 5,000,000 or greater shall have data from:

(aa) 60 monitoring locations; and

(bb) 360 samples each for TTHM and HAA5.

(XI) Ground water systems serving a population less than 500 shall have data from:

(aa) three monitoring locations; and

(bb) three samples for each TTHM and HAA5.

(XII) Ground water systems serving a population between 500 to 9,999 shall have data from:

(aa) three monitoring locations; and

(bb) nine samples each for TTHM and HAA5.

(XIII) Ground water systems serving a population between 10,000 to 99,999 shall have data from:

(aa) 12 monitoring locations; and

(bb) 48 samples each for TTHM and HAA5.

(XIV) Ground water systems serving a population between 100,000 to 499,999 shall have data from:

(aa) 18 monitoring locations; and

(bb) 72 samples each for TTHM and HAA5.

(XV) Ground water systems serving a population of 500,000 or greater shall have data from:

(aa) 24 monitoring locations; and

(bb) 96 samples each for TTHM and HAA5.

(B) Reporting monitoring results. The water system must report the information in this paragraph (a)(i)(B).

(I) The water system must report previously collected monitoring results and certify that the reported monitoring results include all compliance and non-compliance results

generated during the time period beginning with the first reported result and ending with the most recent R309-210-8 results.

(II) The water system must certify that the samples were representative of the entire distribution system and that treatment, and distribution system have not changed significantly since the samples were collected.

(III) The study monitoring plan must include a schematic of the distribution system (including distribution system entry points and their sources, and storage facilities), with notes indicating the locations and dates of all completed or planned system specific study monitoring.

(IV) The water system specific study plan must specify the population served and system type (surface water or ground water).

(V) The water system must retain a complete copy of the system specific study plan submitted under this paragraph (a)(i), including any Executive Secretary modification of the system specific study plan, for as long as the water system is required to retain the IDSE report under paragraph (b)(v) of this section.

(VI) If the water system submits previously collected data that fully meet the number of samples required under paragraph (a)(i)(A)(II) of this section and the Executive Secretary rejects some of the data, the water system must either conduct additional monitoring to replace rejected data on a schedule the Executive Secretary approves or conduct standard monitoring under R309-210-9(2).

(ii) Modeling. The water system may comply through analysis of an extended period simulation hydraulic model. The extended period simulation hydraulic model and analysis must meet the criteria in this paragraph (a)(ii).

(A) Minimum requirements. (I) The model must simulate 24 hour variation in demand and show a consistently repeating 24 hour pattern of residence time.

(II) The model must represent the criteria listed in paragraphs (a)(ii)(A)(II)(aa) through (ii) of this section.

- (aa) 75% of pipe volume;
- (bb) 50% of pipe length;
- (cc) All pressure zones;
- (dd) All 12-inch diameter and larger pipes;
- (ee) All 8-inch and larger pipes that connect pressure zones, influence zones from different sources, storage facilities, major demand areas, pumps, and control valves, or are known or expected to be significant conveyors of water;
- (ff) All 6-inch and larger pipes that connect remote areas of a distribution system to the main portion of the system;
- (gg) All storage facilities with standard operations represented in the model; and
- (hh) All active pump stations with controls represented in the model; and
- (ii) All active control valves.

(III) The model must be calibrated, or have calibration plans, for the current configuration of the distribution system during the period of high TTHM formation potential. All storage facilities must be evaluated as part of the calibration process. All required calibration must be completed no later than 12 months after plan submission.

(B) Reporting modeling. The system specific study plan must include the information in this paragraph (a)(ii)(B).

(I) Tabular or spreadsheet data demonstrating that the model meets requirements in paragraph (a)(ii)(A)(II) of this section.

(II) A description of all calibration activities undertaken, and if calibration is complete, a graph of predicted tank levels versus measured tank levels for the storage facility with the highest residence time in each pressure zone, and a time series graph of the residence time at the longest residence time storage facility in the distribution system

showing the predictions for the entire simulation period (i.e., from time zero until the time it takes to for the model to reach a consistently repeating pattern of residence time).

(III) Model output showing preliminary 24 hour average residence time predictions throughout the distribution system.

(IV) Timing and number of samples representative of the distribution system planned for at least one monitoring period of TTHM and HAA5 dual sample monitoring at a number of locations no less than would be required for the system under standard monitoring in R309-210-9(2) during the historical month of high TTHM. These samples must be taken at locations other than existing R309-210-8 compliance monitoring locations.

(V) Description of how all requirements will be completed no later than 12 months after the water system submits the system specific study plan.

(VI) Schematic of the distribution system (including distribution system entry points and their sources, and storage facilities), with notes indicating the locations and dates of all completed system specific study monitoring (if calibration is complete) and all R309-210-8 compliance monitoring.

(VII) Population served and system type (surface water or ground water).

(VIII) The water system must retain a complete copy of the system specific study plan submitted under this paragraph (a)(ii), including any Executive Secretary modification of the system specific study plan, for as long as the water system is required to retain the IDSE report under paragraph (b)(vii) of this section.

(C) If the water system submits a model that does not fully meet the requirements under paragraph (a)(ii) of this section, the water system must correct the deficiencies and respond to Executive Secretary inquiries concerning the model. If the water system fails to correct deficiencies or respond to inquiries to the Executive Secretary's satisfaction, the water system must conduct standard monitoring under R309-210-9(2).



(b) IDSE report. The IDSE report must include the elements required in paragraphs (b)(i) through (b)(vi) of this section. The water system must submit the IDSE report according to the schedule in R309-210-9(1)(c).

(i) The IDSE report must include all TTHM and HAA5 analytical results from R309-210-8 compliance monitoring and all system specific study monitoring conducted during the period of the system specific study presented in a tabular or spreadsheet format acceptable to the Executive Secretary. If changed from the system specific study plan submitted under paragraph (a) of this section, the IDSE report must also include a schematic of the distribution system, the population served, and system type (surface water or ground water).

(ii) If the water system used the modeling provision under paragraph (a)(ii) of this section, the water system must include final information for the elements described in paragraph (a)(ii)(B) of this section, and a 24-hour time series graph of residence time for each R309-210-10 compliance monitoring location selected.

(iii) The water system must recommend and justify R309-210-10 compliance monitoring locations and timing based on the protocol in R309-210-9(6).

(iv) The IDSE report must include an explanation of any deviations from the approved system specific study plan.

(v) The IDSE report must include the basis (analytical and modeling results) and justification the water system used to select the recommended R309-210-10 monitoring locations.

(vi) The water system may submit the IDSE report in lieu of the system specific study plan on the schedule identified in R309-210-9(1) (c) for submission of the system specific study plan if the water system believes that it has the necessary information by the time that the system specific study plan is due. If the water system elects this approach, the IDSE report must also include all information required under paragraph (a) of this section.

(vii) The water system must retain a complete copy of the IDSE report submitted under this section for 10 years after the date the water system submitted the IDSE report. If the Executive Secretary modifies the R309-210-10 monitoring requirements the water system recommended in the IDSE report or if the Executive Secretary approves alternative monitoring locations, the water system must keep a copy of the Executive Secretary's notification on file for 10 years after the date of the Executive Secretary's notification. The water system must make the IDSE report and any

Executive Secretary notification available for review by the Executive Secretary or the public.

**(4) 40/30 certification.**

(a) Eligibility. The water system is eligible for 40/ 30 certification if it had no TTHM or HAA5 monitoring violations under R309-210-8 of this part and no individual sample exceeded 0.040 mg/L for TTHM or 0.030 mg/L for HAA5 during an eight consecutive calendar quarter period beginning no earlier than the date specified in this paragraph (a).

(i) If the 40/30 certification is due October 1, 2006 then the eligibility for 40/30 certification is based on eight consecutive calendar quarters of R309-210-8 compliance monitoring results beginning no earlier than January 2004.

(ii) If the 40/30 certification is due April 1, 2007 then the eligibility for 40/30 certification is based on eight consecutive calendar quarters of R309-210-8 compliance monitoring results beginning no earlier than January 2004.

(iii) If the 40/30 certification is due October 1, 2007 then the eligibility for 40/30 certification is based on eight consecutive calendar quarters of R309-210-8 compliance monitoring results beginning no earlier than January 2005.

(iv) If the 40/30 certification is due April 1, 2008 then the eligibility for 40/30 certification is based on eight consecutive calendar quarters of R309-210-8 compliance monitoring results beginning no earlier than January 2005.

(v) Unless the water system is on reduced monitoring under R309-210-8 of this part and were not required to monitor during the specified period. If the water system did not monitor during the specified period, the water system must base its eligibility on compliance samples taken during the 12 months preceding the specified period.

(b) 40/30 certification.

(i) The water system must certify to the Executive Secretary that every individual compliance sample taken under R309-210-8 of this part during the periods specified in paragraph (a) of this section were less than or equal to 0.040 mg/L for TTHM and less than or equal to 0.030 mg/L for HAA5, and that the water system did not have any TTHM or HAA5

monitoring violations during the period specified in paragraph (a) of this section.

(ii) The Executive Secretary may require the water system to submit compliance monitoring results, distribution system schematics, and/or recommended R309-210-10 compliance monitoring locations in addition to the certification. If the water system fails to submit the requested information, the Executive Secretary may require standard monitoring under R309-210-9(2) or a system specific study under R309-210-9(3).

(iii) The Executive Secretary may still require standard monitoring under R309-210-9(2) or a system specific study under R309-210-9(3) even if the water system meets the criteria in paragraph (a) of this section.

(iv) A water system must retain a complete copy of its certification submitted under this section for 10 years after the date that the water system submitted the certification. The water system must make the certification, all data upon which the certification is based, and any Executive Secretary notification available for review by the Executive Secretary or the public.

#### **(5) Very small system waivers.**

(a) If the water system serves fewer than 500 people and it has taken TTHM and HAA5 samples under R309-210-8, the water system is not required to comply with this subpart unless the Executive Secretary notifies the water system that it must conduct standard monitoring under R309-210-9(2) or a system specific study under R309-210-9(3).

(b) If the water system has not taken TTHM and HAA5 samples under R309-210-8 or if the Executive Secretary notifies the water system that the water system must comply with this subpart, the water system must conduct standard monitoring under R309-210-9(2) or a system specific study under R309-210-9(3).

#### **(6) Stage 2 (R309-210-10) compliance monitoring location recommendations.**

(a) The IDSE report must include the recommendations and justification for where and during what month(s) TTHM and HAA5 monitoring for R309-210-10 of this part should be conducted. The water system must base the recommendations on the criteria in paragraphs (b) through (e) of this section.

(b) The water system must select the number of monitoring locations specified in this paragraph (b). The water system will use these recommended locations as

R309-210-10 routine compliance monitoring locations, unless Executive Secretary requires different or additional locations. The water system should distribute locations throughout the distribution system to the extent possible.

(i) Surface water systems serving less than 500.

(A) One monitoring period per year. Two dual samples sets must be collected per monitoring period.

(B) One dual sample set must be taken at the high TTHM location in the distribution system.

(C) One dual sample set must be taken at the high HAA5 location in the distribution system.

(ii) Surface water systems serving between 500 to 3,300.

(A) Four monitoring periods per year, dual sample sets must be taken every 90 days. Two dual samples sets must be collected per monitoring period.

(B) One dual sample set must be taken at the high TTHM location in the distribution system.

(C) One dual sample set must be taken at the high HAA5 location in the distribution system.

(iii) Surface water systems serving between 3,301 to 9,999 population.

(A) Four monitoring periods per year, dual sample sets must be taken every 90 days. Two dual samples sets must be collected per monitoring period.

(B) One dual sample set must be taken at the high TTHM locations in the distribution system.

(C) One dual sample set must be taken at the high HAA5 location in the distribution system.

(iv) Surface water systems serving between 10,000 to 49,999 population.

(A) Four monitoring periods per year, dual sample sets must be taken every 90 days. Four dual samples sets must be collected per monitoring period.

(B) Two dual sample sets must be taken at the high TTHM locations in the distribution system.

(C) One dual sample set must be taken at the high HAA5 locations in the distribution system.

(D) One dual sample set must be taken at an existing R309-210-8 compliance location.

(v) Surface water systems serving between 50,000 to 249,999 population.

(A) Four monitoring periods per year, dual sample sets must be taken every 90 days. Eight dual samples sets must be collected per monitoring period.

(B) Three dual sample sets must be taken at the high TTHM locations in the distribution system.

(C) Three dual sample sets must be taken at the high HAA5 locations in the distribution system.

(D) Two dual samples sets must be taken at an existing R309-210-8 compliance location.

(vi) Surface water systems serving between 250,000 to 999,999 population.

(A) Four monitoring periods per year, dual sample sets must be taken every 90 days. 12 dual samples sets must be collected per monitoring period.

(B) Five dual sample sets must be taken at the high TTHM locations in the distribution system.

(C) Four dual sample sets must be taken at the high HAA5 locations in the distribution system.

(D) Three dual sample sets must be taken at an existing R309-210-8 compliance location.

(vii) Surface water systems serving between 1,000,000 to 4,999,999 population.

(A) Four monitoring periods per year, dual sample sets must be taken every 90 days. 16 dual samples sets must be collected per monitoring period.

(B) Six dual sample sets must be taken at the high TTHM locations in the distribution system.

(C) Six dual sample sets must be taken at the high HAA5 locations in the distribution system.

(D) Four dual sample sets must be taken at an existing R309-210-8 compliance location.

(viii) Surface water systems serving 5,000,000 or more population.

(A) Four monitoring periods per year, dual sample sets must be taken every 90 days. 20 dual samples sets must be collected per monitoring period.

(B) Eight dual sample sets must be taken at the high TTHM locations in the distribution system.

(C) Seven dual sample sets must be taken at the high HAA5 locations in the distribution system.

(D) Five dual sample sets must be taken at an existing R309-210-8 compliance location.

(ix) Ground water systems serving less than 500.

(A) One monitoring period per year. Two dual samples sets must be collected per monitoring period.

(B) One dual sample set must be taken at the high TTHM location in the distribution system.

(C) One dual sample set must be taken at the high HAA5 location in the distribution system.

(x) Ground water systems serving between 500 to 9,999 population.

(A) One monitoring period per year. Two dual samples sets must be collected per monitoring period.

(B) One dual sample set must be taken at the high TTHM location in the distribution system.

(C) One dual sample set must be taken at the high HAA5 location in the distribution system.

(xi) Ground water systems serving between 10,000 to 99,999 population.

(A) Four monitoring periods per year, dual sample sets must be taken every 90 days. Four dual samples sets must be collected per monitoring period.

(B) Two dual sample sets must be taken at the high TTHM locations in the distribution system.

(C) One dual sample set must be taken at the high HAA5 locations in the distribution system.

(D) One dual sample set must be taken at an existing R309-210-8 compliance location.

(xii) Ground water systems serving between 100,000 to 499,999 population.

(A) Four monitoring periods per year, dual sample sets must be taken every 90 days. Six dual samples sets must be collected per monitoring period.

(B) Three dual sample sets must be taken at the high TTHM locations in the distribution system.

(C) Two dual sample sets must be taken at the high HAA5 locations in the distribution system.

(D) One dual sample set must be taken at an existing R309-210-8 compliance location.

(xiii) Ground water systems serving 500,000 or greater population.

(A) Four monitoring periods per year, dual sample sets must be taken every 90 days. Eight dual samples sets must be collected per monitoring period.

(B) Three dual sample sets must be taken at the high TTHM locations in the distribution system.

(C) Three dual sample sets must be taken at the high HAA5 locations in the distribution system.

(D) Two dual sample sets must be taken at an existing R309-210-8 compliance location.

(xiv) All systems must monitor during month of highest DBP concentrations.

(xv) Systems on quarterly monitoring must take dual sample sets every 90 days at each monitoring location, except for subpart H systems serving 500-3,300. Systems on annual monitoring and subpart H systems serving 500-3,300 are required to take individual TTHM and HAA5 samples (instead of a dual sample set) at the locations with the highest TTHM and HAA5 concentrations, respectively. Only one location with a dual sample set per monitoring period is needed if highest TTHM and HAA5 concentrations occur at the same location, and month, if monitored annually).

(c) The water system must recommend R309-210-10 compliance monitoring locations based on standard monitoring results, system specific study results, and R309-210-8 compliance monitoring results. The water system must follow the protocol in paragraphs (c)(i) through (c)(viii) of this section. If required to monitor at more than eight locations, the water system must repeat the protocol as necessary. If the water system do not have existing R309-210-8 compliance monitoring results or if the water system do not have enough existing R309-210-8 compliance monitoring results, the water system must repeat the protocol, skipping the provisions of paragraphs (c)(iii) and (c)(vii) of this section as necessary, until the water system have identified the required total number of monitoring locations.

(i) Location with the highest TTHM LRAA not previously selected as a R309-210-10 monitoring location.

(ii) Location with the highest HAA5 LRAA not previously selected as a R309-210-10 monitoring location.

(iii) Existing R309-210-8 average residence time compliance monitoring location (maximum residence time compliance monitoring location for ground water systems) with the highest HAA5 LRAA not previously selected as a R309-210-10 monitoring location.

(iv) Location with the highest TTHM LRAA not previously selected as a R309-210-10 monitoring location.

(v) Location with the highest TTHM LRAA not previously selected as a R309-210-10 monitoring location.

(vi) Location with the highest HAA5 LRAA not previously selected as a R309-210-10 monitoring location.



(vii) Existing R309-210-8 average residence time compliance monitoring location (maximum residence time compliance monitoring location for ground water systems) with the highest TTHM LRAA not previously selected as a R309-210-10 monitoring location.

(viii) Location with the highest HAA5 LRAA not previously selected as a R309-210-10 monitoring location.

(d) The water system may recommend locations other than those specified in paragraph (c) of this section if the water system include a rationale for selecting other locations. If the Executive Secretary approves the alternate locations, the water system must monitor at these locations to determine compliance under R309-210-10 of this part.

(e) The recommended schedule must include R309-210-10 monitoring during the peak historical month for TTHM and HAA5 concentration, unless the Executive Secretary approves another month. Once the water system have identified the peak historical month, and if the water system is required to conduct routine monitoring at least quarterly, the water system must schedule R309-210-10 compliance monitoring at a regular frequency of every 90 days or fewer.

## ***R309-210-10. Disinfection Byproducts - Stage 2 Requirements.***

### **(1) General requirements.**

(a) General. The regulations in this sub-section establish monitoring and other requirements for achieving compliance with maximum contaminant levels based on locational running annual averages (LRAA) for total trihalomethanes (TTHM) and haloacetic acids (five)(HAA5), and for achieving compliance with maximum residual disinfectant residuals for chlorine and chloramine for certain consecutive systems.

(b) Applicability. The water system is subject to these requirements if the system is a community water system or a non-transient non-community water system that uses a primary or residual disinfectant other than ultraviolet light or delivers water that has been treated with a primary or residual disinfectant other than ultraviolet light.

(c) Schedule. The water system must comply with the requirements in this subpart on the schedule in the following sub-paragraphs (c)(i) through (vi) based on the system type.

(i) For water systems that are not part of a combined distribution system and systems that serve the largest population in the combined distribution system.

(A) For water systems that serve a population greater than or equal to 100,000 the water system must comply with R309-210-10 monitoring by April 1, 2012.

(B) For water systems that serve a population from 50,000 to 99,999 the water system must comply with R309-210-10 monitoring by October 1, 2012.

(C) For water systems that serve a population from 10,000 to 49,999 the water system must comply with R309-210-10 monitoring by October 1, 2013.

(D) For water systems that serve a population less than 10,000 the water system must comply with R309-210-10 monitoring by October 1, 2013 if no *Cryptosporidium* monitoring is required under R309-215-15(2)(a)(iv) or October 1, 2014 if *Cryptosporidium* monitoring is required under R309-215-15(a)(iv) or (a)(vi).

(ii) For other water systems that are part of a combined distribution system:

(A) For wholesale systems or consecutive systems the water system must comply with R309-210-10 monitoring at the same time as the system with the earliest compliance date in the combined distribution system.

(iii) The Executive Secretary may grant up to an additional 24 months for compliance with MCLs and operational evaluation levels if the water system requires capital improvements to comply with an MCL.

(iv) The monitoring frequency is specified in R309-210-10(2)(a)(ii).

(A) If the water system is required to conduct quarterly monitoring, the water system must begin monitoring in the first full calendar quarter that includes the compliance date in paragraph (c).

(B) If the water system is required to conduct monitoring at a frequency that is less than quarterly, the water system must begin monitoring in the calendar month recommended in the IDSE report prepared under R309-210-9(2) or R309-210-9(3) or the calendar

month identified in the R309-210-10 monitoring plan developed under R309-210-10(3) no later than 12 months after the compliance date in R309-210-10(1)(c).

(v) If the water system is required to conduct quarterly monitoring, the water system must make compliance calculations at the end of the fourth calendar quarter that follows the compliance date and at the end of each subsequent quarter (or earlier if the LRAA calculated based on fewer than four quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters). If the water system is required to conduct monitoring at a frequency that is less than quarterly, the water system must make compliance calculations beginning with the first compliance sample taken after the compliance date.

(vi) For the purpose of the schedule in this paragraph (c), the Executive Secretary may determine that the combined distribution system does not include certain consecutive systems based on factors such as receiving water from a wholesale system only on an emergency basis or receiving only a small percentage and small volume of water from a wholesale system. The Executive Secretary may also determine that the combined distribution system does not include certain wholesale systems based on factors such as delivering water to a consecutive system only on an emergency basis or delivering only a small percentage and small volume of water to a consecutive system.

(d) Monitoring and compliance.

(i) Systems required to monitor quarterly. To comply with R309-210-10 MCLs in R309-200-5(3)(c)(3)(vi), the water system must calculate LRAAs for TTHM and HAA5 using monitoring results collected under this sub-section and determine that each LRAA does not exceed the MCL. If the water system fails to complete four consecutive quarters of monitoring, the water system must calculate compliance with the MCL based on the average of the available data from the most recent four quarters. If the water system takes more than one sample per quarter at a monitoring location, the water system must average all samples taken in the quarter at that location to determine a quarterly average to be used in the LRAA calculation.

(ii) Systems required to monitor yearly or less frequently. To determine compliance with R309-210-10 MCLs in R309-200-5(3)(c)(3)(vi), the water system must determine that each sample taken is less than the MCL. If any sample exceeds the MCL, the water system must comply with the requirements of R309-210-10(6). If no sample exceeds the MCL, the sample result for each monitoring location is considered the LRAA for that monitoring location.

(e) Violation. The water system is in violation of the monitoring requirements for each quarter that a monitoring result would be used in calculating an LRAA if the water system fail to monitor.

## **(2) Routine monitoring.**

### **(a) Monitoring.**

(i) If the water system submitted an IDSE report, the water system must begin monitoring at the locations and months the water system have recommended in the IDSE report submitted under R309-210-9(6) following the schedule in R309-210-10(1)(c), unless the Executive Secretary requires other locations or additional locations after its review. If the water system submitted a 40/30 certification under R309-210-9(4) or the water system qualified for a very small system waiver under R309-210-9(5) or the water system is a non-transient non-community water system serving less than 10,000, the water system must monitor at the location(s) and dates identified in the monitoring plan in R309-210-8(5), updated as required by R309-210-10(3).

(ii) The water system must monitor at no fewer than the number of locations identified in this paragraph (a)(ii).

(A) Surface water systems serving less than 500 shall have one monitoring period per year and shall collect two dual samples sets per monitoring period.

(B) Surface water systems serving between 500 to 3,300 shall have four monitoring periods per year and shall collect two dual samples sets per monitoring period.

(C) Surface water systems serving between 3,301 to 9,999 population shall have four monitoring periods per year and shall collect two dual samples sets per monitoring period.

(D) Surface water systems serving between 10,000 to 49,999 population shall have four monitoring periods per year and shall collect four dual samples sets per monitoring period.

(E) Surface water systems serving between 50,000 to 249,999 population shall have four monitoring periods per year and shall collect eight dual samples sets per monitoring period.

(F) Surface water systems serving between 250,000 to 999,999 population shall have four monitoring periods per year and shall collect 12 dual samples per monitoring period.

(G) Surface water systems serving between 1,000,000 to 4,999,999 population shall have four monitoring periods per year and shall collect 16 dual samples sets per monitoring period.

(H) Surface water systems serving 5,000,000 or more population shall have four monitoring periods per year and shall collect 20 dual samples sets per monitoring period.

(I) Ground water systems serving less than 500 shall have one monitoring period per year and shall collect two dual samples sets per monitoring period.

(J) Ground water systems serving between 500 to 9,999 population shall have one monitoring period per year and shall collect two dual samples sets per monitoring period.

(K) Ground water systems serving between 10,000 to 99,999 population shall have four monitoring periods per year and shall collect four dual samples sets per monitoring period.

(L) Ground water systems serving between 100,000 to 499,999 population shall have four monitoring periods per year and shall collect six dual samples sets per monitoring period.

(M) Ground water systems serving 500,000 or greater population shall have four monitoring periods per year and shall collect eight dual samples sets per monitoring period.

(N) All systems must monitor during month of highest DBP concentrations.

(O) Systems on quarterly monitoring must take dual sample sets every 90 days at each monitoring location, except for surface water systems serving 500-3,300. Systems on annual monitoring and surface water systems serving 500-3,300 are required to take individual TTHM and HAA5 samples (instead of a dual sample set) at the locations with the highest TTHM and HAA5 concentrations, respectively. Only one location with a dual sample set per monitoring period is needed if highest TTHM and HAA5 concentrations occur at the same location (and month, if monitored annually).

(iii) If the water system is an undisinfected system that begins using a disinfectant other than UV light after the dates in R309-210-9 for complying with the Initial Distribution System Evaluation requirements, the water system must consult with the Executive Secretary to identify compliance monitoring locations for this sub-section. The water system must then develop a monitoring plan under R309-210-10(3) that includes those monitoring locations.

(b) Analytical methods. The water system must use an approved method listed in R309-200-4(3) for TTHM and HAA5 analyses in this sub-section. Analyses must be conducted by laboratories that have received certification by EPA or the Executive Secretary as specified in R309-200-4(3).

### **(3) Stage 2 monitoring plan.**

(a) (i) The water system must develop and implement a monitoring plan to be kept on file for Executive Secretary and public review. The monitoring plan must contain the elements in paragraphs (a)(i)(A) through (a)(i)(D) of this section and be complete no later than the date the water system conduct the initial monitoring under this sub-section.

(A) Monitoring locations;

(B) Monitoring dates;

(C) Compliance calculation procedures; and

(D) Monitoring plans for any other systems in the combined distribution system if the Executive Secretary has reduced monitoring requirements under the Executive Secretary authority in R309-105-5(2).

(ii) If the water system were not required to submit an IDSE report under either R309-210-9(2) or R309-210-9(3), and the water system do not have sufficient R309-210-8 monitoring locations to identify the required number of R309-210-10 compliance monitoring locations indicated in R309-210-9(6)(b), the water system must identify additional locations by alternating selection of locations representing high TTHM levels and high HAA5 levels until the required number of compliance monitoring locations have been identified. The water system must also provide the rationale for identifying the locations as having high levels of TTHM or HAA5. If the water system have more R309-210-8 monitoring locations than required for R309-210-10 compliance monitoring in R309-210-9(6)(b), the water system must identify which locations the water system will use for R309-210-10 compliance monitoring by alternating selection

of locations representing high TTHM levels and high HAA5 levels until the required number of R309-210-10 compliance monitoring locations have been identified.

(b) If the water system is a surface water system serving greater than 3,300 people, the water system must submit a copy of the monitoring plan to the Executive Secretary prior to the date the water system conduct the initial monitoring under this sub-section, unless the IDSE report submitted under R309-210-9 contains all the information required by this section.

(c) The water system may revise the monitoring plan to reflect changes in treatment, distribution system operations and layout (including new service areas), or other factors that may affect TTHM or HAA5 formation, or for Executive Secretary-approved reasons, after consultation with the Executive Secretary regarding the need for changes and the appropriateness of changes. If the water system changes monitoring locations, the water system must replace existing compliance monitoring locations with the lowest LRAA with new locations that reflect the current distribution system locations with expected high TTHM or HAA5 levels. The Executive Secretary may also require modifications in the monitoring plan. If the water system is a surface water system serving greater than 3,300 people, the water system must submit a copy of the modified monitoring plan to the Executive Secretary prior to the date the water system is required to comply with the revised monitoring plan.

#### **(4) Reduced monitoring.**

(a) The water system may reduce monitoring to the level specified in this paragraph (a) any time the LRAA is equal to or less than 0.040 mg/L for TTHM and equal to or less than 0.030 mg/L for HAA5 at all monitoring locations. The water system may only use data collected under the provisions of this sub-section or R309-210-8 to qualify for reduced monitoring. In addition, the source water annual average TOC level, before any treatment, must be less than or equal to 4.0 mg/L at each treatment plant treating surface water or ground water under the direct influence of surface water, based on monitoring conducted under either R309-210-8(2)(a)(iii) or R309-215-12.

(i) Surface water systems serving a population less than 500. Monitoring reduction

(A) Monitoring may not be reduced.

(ii) Surface water systems serving between 500 to 3,300 population.

(A) One monitoring periods per year. 1 TTHM and 1 HAA5 sample must be collected per monitoring period.

(B) One sample at the location and during the quarter with the highest TTHM single measurement in the distribution system.

(C) One sample at the location and during the quarter with the highest HAA5 single measurement in the distribution system.

(D) Only one dual sample set per year is required if the highest TTHM and HAA5 measurements occurred at the same location and quarter.

(iii) Surface water systems serving between 3,301 to 9,999 population.

(A) One monitoring period per year. Two dual samples sets must be collected per monitoring period.

(B) One dual sample set at the location and during the quarter with the highest TTHM single measurement in the distribution system.

(C) One dual sample set at the location and during the quarter with the highest HAA5 single measurement in the distribution system.

(iv) Surface water systems serving between 10,000 to 49,999 population.

(A) Four monitoring periods per year. Two dual samples sets must be collected per monitoring period.

(B) One dual sample set must be taken at the location of the highest TTHM LRAAs.

(C) One dual sample set must be taken at the location of the highest HAA5 LRAAs.

(v) Surface water systems serving between 50,000 to 249,999 population.

(A) Four monitoring periods per year. Four dual samples sets must be collected per monitoring period.

(B) A dual sample set must be taken at each of the locations of the two highest TTHM LRAAs.

(C) A dual sample set must be taken at each of the locations of the two highest HAA5 LRAAs.

(vi) Surface water systems serving between 250,000 to 999,999 population.



(A) Four monitoring periods per year. Six dual samples sets must be collected per monitoring period.

(B) A dual sample set must be taken at each of the locations of the three highest TTHM LRAAs.

(C) A dual sample set must be taken at each of the locations of the three highest HAA5 LRAAs.

(vii) Surface water systems serving between 1,000,000 to 4,999,999 population.

(A) Four monitoring periods per year. Eight dual samples sets must be collected per monitoring period.

(B) A dual sample set must be taken at each of the locations of the four highest TTHM LRAAs.

(C) A dual sample set must be taken at each of the locations of the four highest HAA5 LRAAs.

(viii) Surface water systems serving 5,000,000 or more population.

(A) Four monitoring periods per year. 10 dual samples sets must be collected per monitoring period.

(B) A dual sample set must be taken at each of the locations of the five highest TTHM LRAAs.

(C) A dual sample set must be taken at each of the locations of the five highest HAA5 LRAAs.

(ix) Ground water systems serving less than 500.

(A) One monitoring period every three years. 1 TTHM and 1 HAA5 sample must be collected per monitoring period.

(B) One sample at the location and during the quarter with the highest TTHM single measurement in the distribution system.

(C) One sample at the location and during the quarter with the highest HAA5 single measurement in the distribution system.

(D) Only one dual sample set per year is required if the highest TTHM and HAA5 measurements occurred at the same location and quarter.

(x) Ground water systems serving between 500 to 9,999 population.

(A) One monitoring period per year. 1 TTHM and 1 HAA5 sample must be collected per monitoring period.

(B) One sample at the location and during the quarter with the highest TTHM single measurement in the distribution system.

(C) One sample at the location and during the quarter with the highest HAA5 single measurement in the distribution system.

(D) Only one dual sample set per year is required if the highest TTHM and HAA5 measurements occurred at the same location and quarter.

(xi) Ground water systems serving between 10,000 to 99,999 population.

(A) One monitoring period per year. Two dual samples sets must be collected per monitoring period.

(B) One dual sample set at the location and during the quarter with the highest TTHM single measurement in the distribution system.

(C) One dual sample set at the location and during the quarter with the highest HAA5 single measurement in the distribution system.

(xii) Ground water systems serving between 100,000 to 499,999 population.

(A) Four monitoring periods per year. Two dual samples sets must be collected per monitoring period.

(B) One dual sample set must be taken at the location of the highest TTHM LRAAs.

(C) One dual sample set must be taken at the location of the highest HAA5 LRAAs.

(xiii) Ground water systems serving 500,000 or greater population.

(A) Four monitoring periods per year. Four dual samples sets must be collected per monitoring period.

(B) A dual sample set must be taken at each of the locations of the two highest TTHM LRAAs.

(C) A dual sample set must be taken at each of the locations of the two highest HAA5 LRAAs.

(xiv) Systems on quarterly monitoring must take dual sample sets every 90 days.

(b) The water system may remain on reduced monitoring as long as the TTHM LRAA less than or equal to 0.040 mg/L and the HAA5 LRAA less than or equal to 0.030 mg/L at each monitoring location (for systems with quarterly reduced monitoring) or each TTHM sample less than or equal to 0.060 mg/L and each HAA5 sample less than or equal to 0.045 mg/L (for systems with annual or less frequent monitoring). In addition, the source water annual average TOC level, before any treatment, must be less than or equal to 4.0 mg/L at each treatment plant treating surface water or ground water under the direct influence of surface water, based on monitoring conducted under either R309-210-8(2)(a)(iii) or R309-215-12.

(c) If the LRAA based on quarterly monitoring at any monitoring location exceeds either 0.040 mg/L for TTHM or 0.030 mg/L for HAA5 or if the annual (or less frequent) sample at any location exceeds either 0.060 mg/L for TTHM or 0.045 mg/L for HAA5, or if the source water annual average TOC level, before any treatment, is greater than 4.0 mg/L at any treatment plant treating surface water or ground water under the direct influence of surface water, the water system must resume routine monitoring under R309-210-10(2) or begin increased monitoring if R309-210-10(6) applies.

(d) The Executive Secretary may return the system to routine monitoring at the Executive Secretary's discretion.

## **(5) Additional requirements for consecutive systems.**

If the water system is a consecutive system that does not add a disinfectant but delivers water that has been treated with a primary or residual disinfectant other than ultraviolet light, the water system must comply with analytical and monitoring requirements for chlorine and chloramines in R309-200-4(3) and the compliance requirements in R309-210-8(6)(c)(i) beginning April 1, 2009, unless required earlier by the Executive Secretary, and report monitoring results under R309-105-16(2)(c).

## **(6) Conditions requiring increased monitoring.**

(a) If the water system is required to monitor at a particular location annually or less frequently than annually under R309-210-10(2) or R309-210-10(4), the water system must increase monitoring to dual sample sets once per quarter (taken every 90 days) at all locations if a TTHM sample is greater than 0.080 mg/L or a HAA5 sample is greater than 0.06 mg/L at any location.

(b) The water system is in violation of the MCL when the LRAA exceeds the R309-210-10 MCLs in R309-200-5(3)(c)(vi), calculated based on four consecutive quarters of monitoring (or the LRAA calculated based on fewer than four quarters of data if the MCL would be exceeded regardless of the monitoring results of subsequent quarters). The water system is in violation of the monitoring requirements for each quarter that a monitoring result would be used in calculating an LRAA if the water system fail to monitor.

(c) The water system may return to routine monitoring once the water system have conducted increased monitoring for at least four consecutive quarters and the LRAA for every monitoring location is less than or equal to 0.060 mg/L for TTHM and less than or equal to 0.045 mg/L for HAA5.

## **(7) Operational evaluation levels.**

(a) The water system have exceeded the operational evaluation level at any monitoring location where the sum of the two previous quarters' TTHM results plus twice the current quarter's TTHM result, divided by 4 to determine an average, exceeds 0.080 mg/L, or where the sum of the two previous quarters' HAA5 results plus twice the current quarter's HAA5 result, divided by 4 to determine an average, exceeds 0.060 mg/L.

(b) (i) If the water system exceeds the operational evaluation level, the water system must conduct an operational evaluation and submit a written report of the evaluation to the Executive Secretary no later than 90 days after being notified of the analytical result that causes the water system to exceed the operational evaluation level. The written report must be made available to the public upon request.

(ii) The operational evaluation must include an examination of system treatment and distribution operational practices, including storage tank operations, excess storage capacity, distribution system flushing, changes in sources or source water quality, and treatment changes or problems that may contribute to TTHM and HAA5 formation and what steps could be considered to minimize future exceedences.

(A) The water system may request and the Executive Secretary may allow the water system to limit the scope of the evaluation if

the water system is able to identify the cause of the operational evaluation level exceedance.

(B) The request to limit the scope of the evaluation does not extend the schedule in paragraph (b)(i) of this section for submitting the written report. The Executive Secretary must approve this limited scope of evaluation in writing and the water system must keep that approval with the completed report.

## **(8) Requirements for remaining on reduced TTHM and HAA5 monitoring based on R309-210-8 results.**

The water system may remain on reduced monitoring after the dates identified in R309-210-10(1)(c) for compliance with this sub-section only if the water system qualifies for a 40/30 certification under R309-210-9(4) or have received a very small system waiver under R309-210-9(5), plus the water system meets the reduced monitoring criteria in R309-210-10(4)(a), and the water system does not change or add monitoring locations from those used for compliance monitoring under R309-210-8. If the monitoring locations under this sub-section differ from the monitoring locations under R309-210-8, the water system may not remain on reduced monitoring after the dates identified in R309-210-10(1)(c) for compliance with this sub-section.

## **(9) Requirements for remaining on increased TTHM and HAA5 monitoring based on R309-210-8 results.**

If the water system was on increased monitoring under R309-210-8(2)(a), the water system must remain on increased monitoring until the water system qualifies for a return to routine monitoring under R309-210-10(6)(c). The water system must conduct increased monitoring under R309-210-10(6) at the monitoring locations in the monitoring plan developed under R309-210-10(3) beginning at the date identified in R309-210-10(1)(c) for compliance with this sub-section and remain on increased monitoring until the water system qualifies for a return to routine monitoring under R309-210-10(6)(c).

## **(10) Reporting and recordkeeping requirements.**

### **(a) Reporting.**

(i) The water system must report the following information for each monitoring location to the Executive Secretary within 10 days of the end of any quarter in which monitoring is required:

(A) Number of samples taken during the last quarter.

(B) Date and results of each sample taken during the last quarter.

(C) Arithmetic average of quarterly results for the last four quarters for each monitoring location (LRAA), beginning at the end of the fourth calendar quarter that follows the compliance date and at the end of each subsequent quarter. If the LRAA calculated based on fewer than four quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters, the water system must report this information to the Executive Secretary as part of the first report due following the compliance date or anytime thereafter that this determination is made. If the water system is required to conduct monitoring at a frequency that is less than quarterly, the water system must make compliance calculations beginning with the first compliance sample taken after the compliance date, unless the water system is required to conduct increased monitoring under R309-210-10(6).

(D) Whether, based on R309-200-5(3)(c)(vi) and this sub-section, the MCL was violated at any monitoring location.

(E) Any operational evaluation levels that were exceeded during the quarter and, if so, the location and date, and the calculated TTHM and HAA5 levels.

(ii) If the system is a surface water system seeking to qualify for or remain on reduced TTHM/HAA5 monitoring, the water system must report the following source water TOC information for each treatment plant that treats surface water or ground water under the direct influence of surface water to the Executive Secretary within 10 days of the end of any quarter in which monitoring is required:

(A) The number of source water TOC samples taken each month during last quarter.

(B) The date and result of each sample taken during last quarter.

(C) The quarterly average of monthly samples taken during last quarter or the result of the quarterly sample.

(D) The running annual average (RAA) of quarterly averages from the past four quarters.

(E) Whether the RAA exceeded 4.0 mg/L.

(iii) The Executive Secretary may choose to perform calculations and determine whether the MCL was exceeded or the system is eligible for reduced monitoring in lieu of having the system report that information.

(b) Recordkeeping. The water system must retain any R309-210-10 monitoring plans and the R309-210-10 monitoring results as required by R309-105-17.

KEY: drinking water, distribution system monitoring, compliance determinations

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